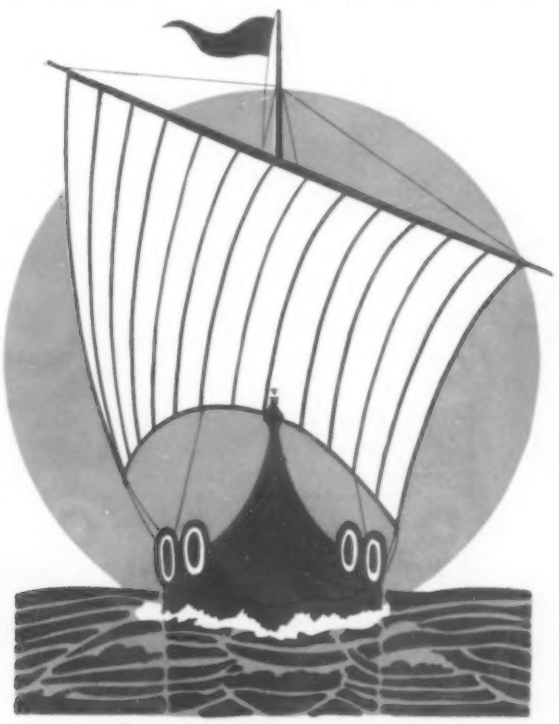
Yachting

JANUARY, 1919



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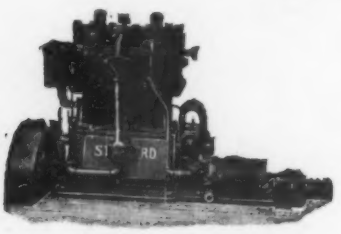

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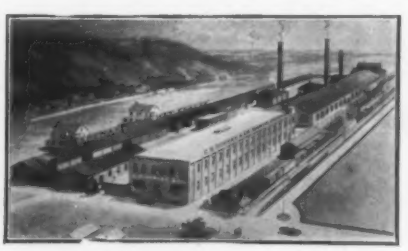

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WILLIAM ATKIN, Editor STILLMAN TAYLOR, Associate

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WE stand upon the threshold of a new year and the vista as we peer into the unused days, and weeks, and months beyond promises well for, I like to think, all of us.

There is first of all the never-to-be-forgotten and very real, because it is here, day of peace with its soldiers' and sailors' homecomings, and its far-reaching joys.

And then among these unused days the spirit of reconstruction will breathe a better hope for all of us to follow—and we shall.

By the firelights of this coming March we may all visualize the happiness and the contentment of the twilights of another June, a June that shall hear not the rattle of rifle fire, nor the roar of murderous guns, nor the challenge of the alert patrol boat that 'tends the nets, and the channels at the harbor's mouth.

Yes, the threshold is clear, and it needs only the best thoughts and efforts of all of us to lead into the finest kind of a New Year both for industry and for recreation—and we, shipmates, we spell recreation, Y-a-c-h-t-i-n-g.

A Happy New Year!

WILLIAM ATKIN, Editor.

MAR 13 1919

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YACHTING

JANUARY, 1919

VOLUME XXV, NUMBER I

25 Cents a Copy
$2.50 a Year

Courtesy Yachting Monthly

A Chinese junk from a painting by a Chinese artist

The Chinese Junk *Keying*, 1846

An Interesting Account of a Voyage from Canton to Boston in a Chinese Built and Sailed Craft. Written in 1884 by Rear-Admiral Geo. Henry Preble, U. S. N. for a Popular Magazine of that Time

SINCE Vasco da Gama sailed from Lisbon, discovered and rounded the Cape of Good Hope in 1497, and proceeded to India, there has been no voyage around that cape from the East Indies or China more remarkable than the voyage of this Chinese Junk from Canton to the United States in 1846. She has the honor of being the pioneer "junk," and, up to the present time, the only Chinese vessel that has made the voyage. As Chinese junks are now being replaced by vessels of modern construction it is probable she will remain the only "junk" that has performed the voyage.

The *Keying*, a name given her by her European purchasers, left Canton, under the command of Captain Kellett, an Englishman, on the 19th of October, 1846, rounded the Cape of Good Hope, March 30, and anchored at St. Helena, April 17, 1847, where she remained until the 23rd and then put to sea. The original intention was to proceed to England, but the mutinous state of the crew and a deficiency of provisions compelled Captain Kellett to steer for a United States port. She arrived accordingly at New York on the 9th of July, 1847, where she was exhibited, and subsequently at Boston. Her crew on arrival consisted of forty Chinese and twelve Europeans.

The following advertisement of her exhibition in Boston is from the *Boston Evening Transcript* of December 7, 1847, and it was continued daily in that journal until December 18:

"THE CHINESE JUNK, OR CELESTIAL SHIP!

"This astonishing vessel, having been roofed over for the convenience of visitors, is now READY FOR EXHIBITION AT CHARLESTOWN BRIDGE WHARF.

"Also to be seen on board, the Mandarina, 'HESING,' the first and only person of Chinese rank that ever visited this part of the globe.

"Admittance 25 cents. Open from 9 A. M. to 4 P. M.

"A splendid lithographic likeness of the Mandarin 'Hesing,' executed by Davig.on, may be had on board, also a colo.ed lithographic design of the Chinese Junk."

The *Transcript* of the 17th says: "A large model of the Chinese junk drawn on a cart, and preceded by a wagon containing a band of musicians passed through State Street, yesterday, and attracted much attention."

The junk was cleared for London, to Elliot & Gray, February 12, and sailed from Boston for England on the 18th of February, 1848, reached Jersey on the 15th of March, after a passage across of twenty-five days, and was towed by a steamer to the Thames, the whole voyage from Canton, including stops, having occupied nearly a year and a half. After her arrival she was exhibited in East India docks, London, and was on exhibition on the Thames, in London, in 1851, when I saw her there, an ordinary Chinese merchant-junk of large size.

The *Keying* was built of teak, and was of about seven hundred and

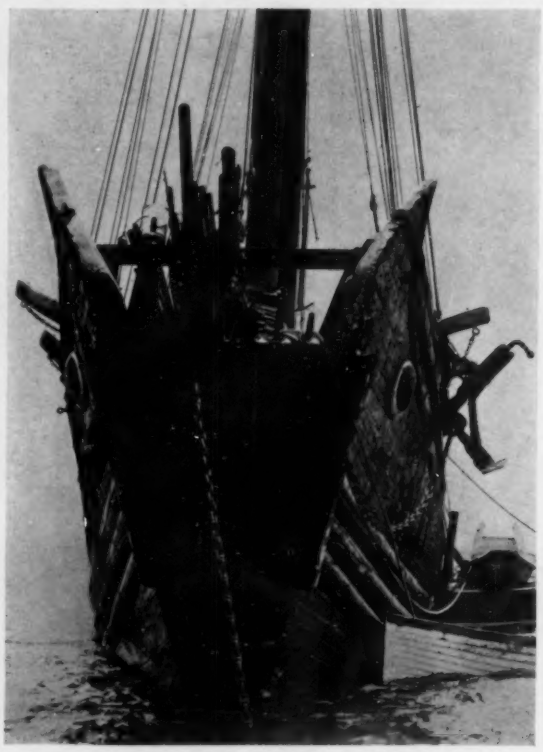
twenty tons burden. She had a length of one hundred and sixty feet; beam, twenty-five and a half feet; depth of hold, twelve feet; and her height from the water was forty-five feet. Her rudder weighed eight tons; mainsail, nine tons. Her mainmast was seventy-five feet long from the deck. Upper mainyard sixty-seven feet long; lower mainyard, sixty-one feet long.

The *Keying*, soon after her arrival in England, was visited by the Duke of Wellington, who spent over an hour in the examination of her interior fittings, embellishments, and means of defense, and on the 16th of May, 1848, she was visited by Queen Victoria and Prince Albert, and the next day by the dowager Queen Adelaide and a distinguished party. On the 19th she was opened for public exhibition in the East India docks. Surrounded by steamships of modern construction, the strange vessel had an arkite, aboriginal character beside those huge scientific structures. As a requisite precaution, the junk beside the ship, with its three masts draped with flags and streamers, and its mainmast surmounted with a fish-like vane, bearing, in Chinese characters, "Good Luck to the Junk." The vessel and everything on board transported you back to the fourteenth and fifteenth centuries.

The rudder was, perhaps, the most singular part of the vessel. It was made of iron, wood, and teak, bound with iron, and its weight was between seven and a half and eight tons.

It was perforated with rhomboidal holes, and in deep water was let down twelve feet below the bottom of the vessel. The great elevation of the stern (forty-five feet) allowed of the rudder's being elevated or depressed, according to the depth of water, and so the draught might be made to vary from twelve to twenty-four feet. When the rudder was raised up in shallow water, the vessel was steered by a short tiller on the second poop. When let down to its greatest depth, it occasionally required the strength of fifteen men to work the large tiller, and even then the aid of a luff tackle purchase and patent blocks; otherwise thirty men would not suffice. On one occasion during the voyage, when the junk was running before a fresh gale, attended with hail squalls, a tiller-rope of nine inches was snapped asunder. Instead of braces and pintles, two immense ropes, made of bamboo and grass, were passed under the bottom and over the bows to the upper deck, where they were fastened, thus confining the rudder to the stern.

The anchors were made of iron and wood; one weighed three thousand, the other two thousand seven hundred pounds. The flukes were shod with iron, and attached to the shank by strong lashings of bamboo. The stock was fixed to the crown, and was composed of three pieces of wood, lashed together by rattan ropes. The flukes were of about the same dimensions as on similar-sized iron anchors with us, but straight, not rounded, and without palms. The kedges had only one fluke.



Can you imagine a sea-going vessel with a squared off bow?

The construction of the junk was of the roughest kind,—the sides of the timbers were not squared, but left as they grew; no artificial means were resorted to for any bends; whenever a branch was found with the requisite natural curvature, it was employed without further adaptation. Fine work, the Chinese said, was ridiculous where not necessary, and it was absurd to make the boards of the hold level and smooth, when goods and ballast were to be put there, and the timbers on the sides or deck were quite good enough to be shot at without bestowing any pains upon them.

Everything on board was different from what is seen on a European vessel,—the mode of construction, the absence of a keel, bowsprit, and shrouds, the materials employed, the masts, the sail, the yard, the rudder, the compass, and the anchor, were all dissimilar. The appearance of the deck, however, reminded one of the pictures of the ships of war of the sixteenth century, such as the *Great Harry*, with its lofty forecastle and poop. Her immense poop had three galleries rising one above the other and her square bow was of the same height as the stern, or poop. The stern was elaborately painted with birds of imaginary forms, and on the bow were painted two large eyes. A similar ornament was used by the ancients on their vessels, the emblem denoting vigilance and activity. The Chinese, when asked about them, say: "Have eye, can see; can see, can savey. No have eye, no can see; no can see, no savey."

During the voyage in crossing and recrossing the Atlantic she proved an admirable seaboat, and rode out the violent storms and the buffeting of the waves she encountered in a surprising way. Her sailing qualities were, however, found to be very imperfect, and with anything like a head-wind she went fast to leeward.

From the bow to the afterpart of the *Keying* there was a series of twenty water-tight chests or compartments, similar to those that have been adopted in all modern steam vessels. The vessel had no keelson, and consequently the mast was not stepped, the end, or heel, of the mainmast being about four feet from the bottom, and held in its place by a toggle. Examining the construction of the vessel, instead of the timbers being first raised, as with us, they were to be put in their places, and the vessel was fastened together with immense spiked nails. The next process was doubling and clamping above and below the decks. Two immense beams or string-pieces were then ranged below, fore and aft, which kept other beams in their places. The deck frames were an arch; and a platform erected on it protected it from the sun and from injuries otherwise inevitable. The seams of the vessel were paid with a cement of putty called chinam, made of burnt pounded oyster-shells and the oil from the chinam-tree. When dried the chinam becomes very hard, and never starts; the seams were thus made watertight. The gunwales were very large, enabling the sailors

THE Chinese, when asked about the ornamental eyes that are placed on the bows of their vessels say, "Have eye, can see; can see, can savey. No have eye, no can see; no can see, no can savey." Which is excellent logic.

to pass outside the vessel. The wales also projected three feet from the side. It was supposed she might measure about four hundred tons and carry seven hundred.

A writer for Chambers' Edinburgh Journal, narrating his visit to the *Keying*, says:—

"On going on board we were surprised at the little walking- and standing-room on deck. From a limited clear space in the middle, stairs ascend to the higher portions fore and aft far above our head. Large beams gaudily painted meet the eye everywhere; and before us, on one side of the vessel, is an erection forming a galley, or cooking-house, which seems a monstrous encumbrance. Within this cooking-house there are two large iron pans fixed on brick-work furnaces which open outside. In one of these is boiled rice, covered with a half-cask, to confine the rice, which swells in boiling, and to prevent it from being thrown out when the vessel rolls. The other pan is used for frying. On the deck also are three very large wooden tanks, which hold about eight thousand gallons of water. Beneath the openings to the furnaces is a trough, or foose, sunk in the deck, which is filled with water to receive the cinders, that fall from the furnaces, to avoid the risk of fire.

"We now descend to the saloon, which is half-sunk below the deck, and half-raised to form the first story of the elevated poop.

"The saloon is thirty-two feet long, twenty-eight broad, and fifteen and a half feet high. Detracting from this spaciousness, however, are two beams traversing the length of the apartment breast-high, as if to bind the vessel in this direction, so that in crossing from one side to another it is necessary to stoop twice beneath these uncouth stays. With this exception the cabin is tastefully arranged; its sides and ceiling are painted yellow, and plenteously covered with paintings of birds, flowers, monkeys, etc. On the sides are also hung some Chinese paintings in frames and musical instruments. From the roof depend a number of lanterns of fanciful shape and variegated colors. The Chinese are remarkably fond of lanterns and lamps, and, as a regulation of police, every person is bound to carry one after nightfall. 'To such an absurd length do they carry this custom,' says a printed account of the *Keying*, 'that when one of the batteries which had fired upon the *Alceste* in her passage up the Bogue had been silenced by her broadside, and the soldiers who manned it fled in the greatest alarm, instead of endeavoring to escape in the darkness, each man seized his lantern and climbed up the steeps behind the fort. The great lighted and painted balloons which they carried formed a most excellent mark for such of our marines as might wish to fire at the retreating Chinese, all fear of the consequences being forgotten in the practice of their daily duty, or rather nightly, custom.

"The saloon contains a round central table of beautiful inlaid wood, and a number of seats of equally tasteful construction. But the most remarkable piece of furniture is a cupboard-like shrine at the inner extremity of the apartment. This is a Joss-house, as it is called by the Chinese, from the Portuguese word Deos, for God, or deity, which they have engrafted in their language. The Joss-house, which has considerable resemblance to a Punch's show-box, contains in a sitting attitude the idol Chin-tee, carved out of a solid piece of camphor-wood, and richly gilt. The odd thing about this female deity is that she has eighteen arms, which spread out like a fan on each side. In each hand is held an object in ordinary use, such as flag, an arrow, a bow, a flower, a bell, etc. The goddess sits so far within the Joss-house that space is left in front for various devotional apparatus, among which is a censer containing gilt paper and pieces of scented wood, presented as offerings; a piece of wood is slowly burning. The face of the altar table has a scarlet ground with gilt carvings of flowers, insects, and imperial dragons, and on each side is a square painted green, on which, inscribed in Chinese charac-

ALTHOUGH these illustrations are not of the famous old "Keying" they are of a similar craft of great age. For centuries the Chinese have built and sailed these, to our eyes, weird craft with their carefully carved and painted sterns, rough and crude planking, and many battened sails.

THE roughest kind of construction and finish is pronounced good enough for the building of a junk. Fine work, these curious people think, is quite out of place where not necessary.

ters, is an invitation to worshipers to bring plenty of gold and agate stones. Ascending to the deck and going up a flight of steps to the second gallery, between two small cabins in a Joss-house for the use of the sailors, which is less ornamental, but similarly provided with Joss-sticks and other native offerings. The idol is this Joss-house is the deity of the sea, with her two attendants, each with a red scarf. In front is an earthen pot containing the sacred earth and rice, and here also is a lighted lamp. Near the goddess is a piece of wood of the *Keying*, highly venerated by the crew, and placed there as symbolical that all of the vessel is protected by the deity. Along the top of the stern are ranged a number of small flags, which add gayety to the exhibition."

From another source we learn that the saloon was entered "beneath a sort of skylight, the sides of which were filled with prepared oyster-shells, commonly used in China instead of glass, which is too costly for general use," and that the pictorial embellishments "were painted by a good-natured native of Canton named Sam-Sing, who is on board, and who left his country and his family to accompany the *Keying* wherever she goes as her painter in ordinary," and that right and left of the saloon-ladder were two curious portraits of the emperor, well worth inspection. The floor was covered with matting, and around the apartment were cases, "and a great number of little occasional tables, besides pier- and loo-tables, settees, and arm-chairs with seats of marble, and at one end a couch, such as is used when smoking opium, for which there was a pair of pipes. In the cases and upon the tables was a host of 'curiosities,' including a state umbrella, various models, and musical instruments," etc.

Returning to the narrative in Chambers': "In this slight sketch," the writer says, "we have omitted any notice of a variety of curiosities (those above mentioned) placed in glass cases or scattered about the deck and galleries. Likewise of a number of Chinese sailors and officers, who, in proper costumes, are lounging about the ship, as if very much at a loss what to do in the crowd of lady and gentlemen visitors. The Chinese sailors, it appears, were difficult to manage during the voyage. They were at first very particular in the performance of their idolatrous customs, burning paper, beating gongs, etc., in honor of their gods; but after a while they became negligent, or rather they adandoned the representations of Captain Kellett. One of their most common and highly-prized superstitions was a belief in the efficacy of tying red rags on the rudder, cable, mast, and the principal parts of the vessel as safeguards against danger. On one occasion, when apprehensive of being attacked by a Malay proa, they tied red rags to the guns. One of their most revered objects was the compass: before this they would place tea, sweet cakes, and pork, to keep it true and faithful. Gradually they became accustomed to the European compass, which was marked, at their request with the thirty-two points in Chinese figures and eight divisions and then put aside all of their own but two. During the storms which the *Keying* encountered they at first were exceedingly terrified, but were soon restored to comparative calm on observing the steadiness and confidence of the English part of the crew. When a storm was over they burned Joss-paper in great abundance. A very interesting personage on board the *Keying* is Hesing, a mandarin of the fifth class, whose distinctive mark is a crystal button on the top of his cap. He is forty-six years old, intelligent, amiable, and gentlemanly. During the voyage he learned a little English, and was taught to write his name in English characters, an accomplishment of which he is somewhat proud."

The *Keying* was not a new vessel. She had for many years been engaged in the Chinese coasting trade, and was purchased for the purpose of being exhibited in England as a curiosity. Considerable address was required in the negotiation, as well as getting her safely past the Bogue forts. Her Chinese name I have not been able to ascertain.

A printed description of this remarkable vessel and of her voyage was sold on board at New York, Boston, and London. I have, however, been unable to obtain a copy of the pamphlet, from which, doubtless, much of the foregoing descriptions have been derived; and I have also endeavored to obtain an account of her later history by correspondence and the insertion of queries in Boston, New York, and English papers, but hitherto without result, although she was visited by thousands on both sides of the Atlantic and received the attention of royalty only thirty-five years ago. After she ceased to be attractive as a show what disposition was made of her I have so far been unable to ascertain.

The Huns Knew a Good Thing When They Saw It

AN echo of Splitdorf activity in the War—the Splitdorf of ignition renown in the airplane, automobile, truck, motorcycle, tractor and motorboat field—was sounded recently. A. B. Chace, factory manager of the Splitdorf Electrical Company's home plant at Newark, N. J., recently received a letter from Arthur J. Fleidner, one of the many Splitdorf workmen serving with the American Expeditionary Forces in France. Fleidner who was one of the first to be included in the overseas contingent in the course of an interesting letter and commenting upon the fact that even the Huns knew a good thing when they saw it, writes:

"Well the Splitdorf Dixie 441 and the rest of the Dixies are standing right up at the front, as they are on all Packard Trucks and Indian motorcycles. We have had no trouble with them and I hope that they put them on all machines after this.

"I have a piece of a breaker bar from a Splitdorf Magneto which was on a 'Hun' airplane which was brought down right near where we were stationed. We boys are giving the 'Hun' all they want, and it won't be long now when everything will be over."

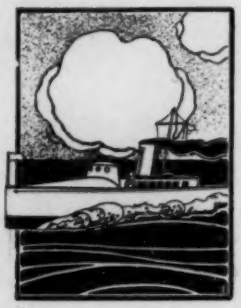
UNDER SAIL ABOARD THE SCHOONER YACHT *AXEN*

CAPTAIN CHRISTIANSEN has gained a reputation as a tip-top racing skipper, and during the last season he has been master of **Axen.**

DURING the last season this yacht, which by the way was formerly **Germanic,** built for Bertha Krupp in Germany several years ago, was used, in connection with the Emergency Fleet Corporations' activities, as a training vessel for students of seamanship and navigation.

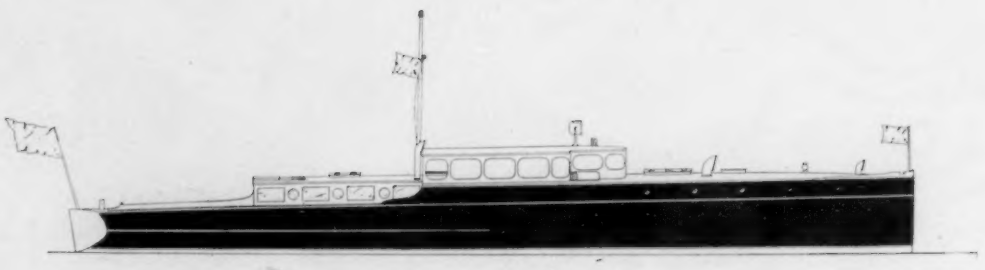
MR. CHRISTOFFER Hannevig, standing in the companionway, is the owner of **Axen,** he having purchased her from the British Government where she was interned and seized a few days after Germany started to conquer the world. The man in uniform is Captain Felix Riesenberg of the Schoolship Newport.

AXEN, although a remarkably fast craft and one upon which every comfort is provided is not fitted with power, the installation of which her owner feels would ruin her fine qualities as a sailer. Therefore rather than destroy the sailing ability of **Axen** he recently purchased **Katoura,** the 162 foot Herreshoff designed and built auxiliary schooner, built for Mr. Robert E. Tod in 1915.



An After the War Motor Yacht

Alfred Luders Has Produced the Designs of an Interesting Type of Cruiser Which Fulfils Well the Needs of the Yachtsman Desiring a Fast and Comfortable Yacht for Use as a Ferry Between Town and Country



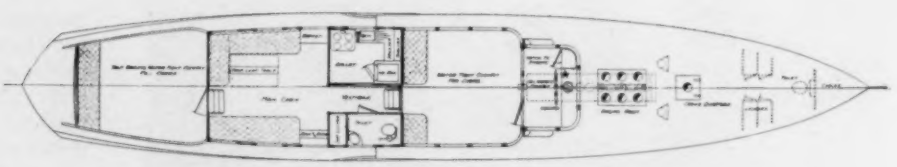
AMONG the motor yachts to be built for the season of 1919 will be a craft recently designed by the Luders Marine Construction Company at Stamford, Conn., the profile and cabin plan of which is shown herewith.

She is an ideal craft for ferry service between the owner's summer home on the Sound and his office in town, for with a speed of 18 knots an hour combined with generous beam this yacht is as comfortable, both indoors and out, as is possible in one of her dimensions, yet retaining the fleetness of a fast runabout.

The arrangement follows the tried and proved Luders' practice of a trunk cabin abaft the raised deck in which is located the main cabin with a toilet room and galley adjoining forward, and a cockpit aft.

Unique though is the shelter constructed over the sunken bridge deck. Here is protection from flying spray and bad weather. Just forward a pilot house is placed from which vantage position a clear vista is obtained ahead and over an arc of the horizon of more than 180°. The location of the pilot house here places the sailor-man at the wheel close at hand yet isolated from the owner and his guests: quite out of the way.

The motor is directly below the pilot house which spells simplicity of the lever control mechanism, while forward there are quarters for a crew of two.



The yacht has an overall length of 71 ft. and is 12½ ft. wide. Two 300 h. p. Sterling motors will be installed, and although the craft will be ruggedly constructed they should easily propel her at the designed speed; 18 knots an hour.

CRAFT OF THE MULTITUDE

JOHN DAVENPORT

THERE are few craft that have so many uses, and that appeal to so wide an audience, as a canoe. On salt water bays, on the forest shaded shores of inland lakes, on the little stream that flows across the farm, or in the surf, as the plaything of the bathers, the canoe is ever present.

INTEREST in the sailing canoe began years ago and has since healthily increased. Many years have seen international races in which English, Canadian and American boats and skippers have competed.

THE camper has in the canoe a craft of great ability. Fitted with a small outboard motor, or under paddles, a speedy vehicle is at hand to run the errands of camp. Light in draft the canoe may be floated in the shallowest water and still retain many of the qualities that make a craft capable of traversing rough water.

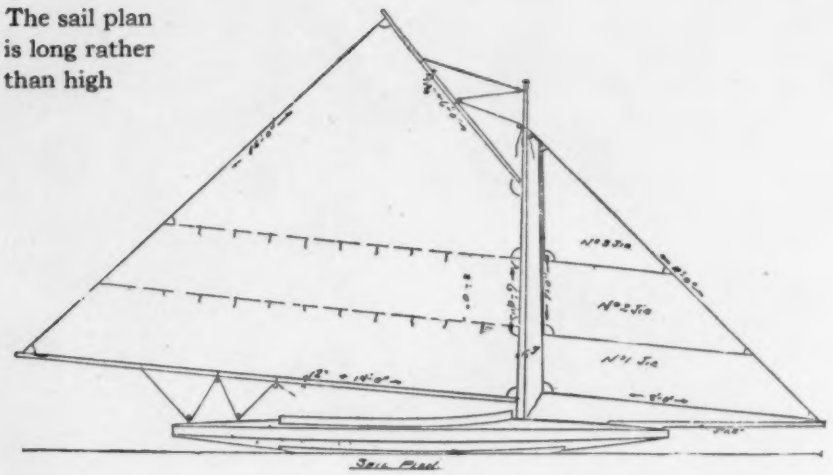
ONE of the great advantages of a canoe is its lightness. Not only does this create a buoyant and easily propelled craft but provides a boat that may be carried by two men past canal locks, over short portages, or over the fields to a lake in the neighboring county.

EVERYWHERE is the haunt of the canoe. These craft wherever water lays carry hundreds of thousands of recreation seekers who love the great outdoors. Upon the ponds in our city parks, or along the beaches of Maine the canoe is one of the lures that carries the multitude afloat.

Dimensions and Specifications for Building a Scooter

GREAT joy comes into the life of the winter yachtsman—the sailor of the ice—with the advent of frosty days. He looks to the runners of his craft, to the spars, to the rigging. To the novice in this outdoor game the scooter appeals, especially in salt water regions, and for the novice the article below is written.

The sail plan is long rather than high



THE following specifications and instructions for building are for a scooter 14 feet long, 4 feet wide, and 1 foot deep, from the top of the coamiig. This boat was designed for racing and has a bowsprit 3 feet long and carries 91 square feet of sail. The mainsail is shown with two reefs for use in heavy weather. It is desirable in this boat to carry extra jibs—one suitable for each reef, and the size of the jibs is shown on the sail plan. This is essential in order to maintain the proper balance with the mainsail, as the boats are steered by balance of the sails alone.

A fully equipped 14-foot scooter costs from $100 to $150, if you have it built. By following the directions here given any amateur should be able to get together a very good one at an outlay of less than $50 for all material, including sails and rigging.

The following is a fairly complete list of all that will be required, except perhaps a few odd size screws and boat nails, paint, varnish, etc.: 125 feet clear ½-inch pine for deck and bottom; 20 feet of 1½-inch oak for bottom ribs, runners, etc.; 10 feet 1½-inch cedar for deck ribs; two strips of ⅞" by 3½" by 15-foot clear pine for inner side plank; three strips of ½" by 4½" by 15-foot oak for outer side plank and coaming; 5 gross 1-inch No. 8 brass screws for deck, etc.; 1 gross 1½-inch No. 10 brass screws for deck, etc.; 2 pounds 1¼-inch galvanized boat nails for bottom; 2 dozen ¼" by 3¾" bolts for runner woods; 1 pair ¼" by 1" by 9 feet cold rolled steel shoes and screws for same. Spar of stiff spruce for mast, boom, gaff, bowsprit, jibbooms, and pike pole. The planking referred to above will have to be sawed into lengths of the widths shown on diagrams for frames, planks, etc.

To begin work, take the ⅞" by 3½" side planks and plane one edge straight. Taper the ends, as shown, to 2 inches. Then get out stem and transom, which should be cut amply wide to receive crown of deck and bottom. Snap a chalk line on a level floor and mark a place for the stem. Seven feet aft of this nail a 14-inch crosspiece, extending, at right angles, two feet out each side.

Now nail the side planks, straight edge down, to stem and bend them around the crosspiece until the after ends come within 9 inches of the center line. Fit in transom, leaving enough wood underneath to receive crown of deck. (The boat is built up-side down). Block the whole frame up from the floor an inch or two to allow for this, Space off the ribs 10 inches from center to center Get these out of the 1½-inch oak, and mould so as to give crown of about 3½ inches with a flat place 2 feet wide in center.

Put in the fifth and twelfth ribs and then spring ribbands over them from stem to stern to give the proper fore and aft curve to bottom. Make all the other frames come to these ribbands. Trim side planks to fit bevels shown and proceed with planking with the ½-inch pine, making planks about 4 inches wide, using nails in ribs and screws at the ends, in the dise planks.

When the bottom is on, caulked and primed, raise the boat up on benches for convenience in putting on the runner woods and steel shoes.

Make straight lines where these are to go, one foot each side of center of the keel, exactly parallel, for 9 feet of the length, stopping at bow end 3 feet from point of stem. Take the 1½-inch oak and scribe it to fit the bottom. Then, 18 inches from each end, rip it off so as to leave a runner about 2 inches high, with a true curve for the 6 feet of ½-inch rise. Give the ends a gentle curve down to the points where they die on the bottom.

Plane off the outside wood from the upper edge till top is 1 inch in width and bevel ¼ inch for steel shoe, as shown in detail drawing. Fasten with ¼ by 3¾-inch bolts, one in each timber. Screw the steel shoes to these wooden runners, first shaping them to fit so that the screws will have no undue strain in pulling the steel down at the ends.

Now turn the boat over and put in deck frames, giving them a crown sufficient to make the hull 1 foot deep, including coaming.

These frames are made of 1½-inch cedar and the deck is fastened with the 1-inch brass screws. Put binding pieces of light stuff between the bottom and the deck frames at the ends, against inner side plank, and fasten well as per detail drawings.

The cockpit opening may be of any desired shape, only the mast step must be put in place before decking in case the cockpit is made smaller than shown on the plan.

Trim the edges of deck and bottom planking plumb with side plank, and screw the ½ by 4½-inch oak outer side plank the entire length,

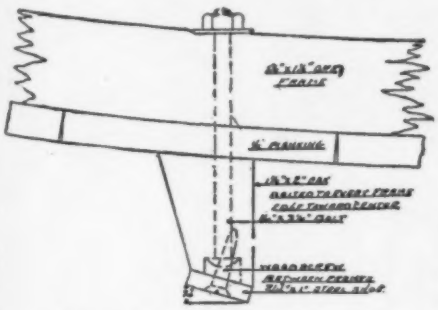
trimming off flush with bottom and deck. This binds the whole deck and bottom and protects the edges against cutting in thin ice.

Dress the mast to at least three inches in diameter at the deck. The boom and gaff need be no greater than two inches at the greatest diameter. Make the bowsprit of 2" by 3" spruce and fasten so that it points slightly above horizontal line.

Provide the boat with a pike pole with an 8-foot handle similar to a regular ice hook, but with a flattened crosspiece near the hook for use in getting out of thin ice when the wind fails. An oar should always be carried for use in open water.

To sail the scooter trim the mainsail fairly flat. Take the jib sheet in the hand and never lose it, as all the steering on the ice is done by trimming in and slacking off that sail.

You will soon discover its effectiveness and in a few trials you will be surprised by the ease with which the rudderless boat can be managed. It is, in fact, easier to navigate than many water boats and any person at all familiar with sailing craft can soon become a proficient scooter skipper.



Details of the scooter runners

A modification of the scooter is now frequently seen in the so-called motor scooter. This consists of the hull of a scooter fitted with a gasoline engine, in which several methods of transmitting the power are used. In some of these the propulsion is obtained by means of a wheel with a number of short chisel-toothed spikes in its rim which engage the ice, while in others a propeller that works against the air, as in an aeroplane, is used. Each of these methods has proved successful and great speed is claimed for the boats thus equipped, as high as fifty to sixty miles an hour having been obtained, it is said, though reliable data are lacking. In the former methods of propulsion, however, the boats are only good on ice, as the spiked wheel has no appreciable hold in the water. Power scootering has not as yet developed to any extent and hardly occupies a place in the field of ice-boating or scootering.

Racing in Southern Waters

THE fifth annual Miami Midwinter Regatta will be held February 14th and 15th in the deep water yacht harbor adjoining Miami Beach in Biscayne Bay, according to official announcement by the Miami Chamber of Commerce, under whose auspices the event is conducted.

The regatta will consist of two classes of events, one for open displacement boats, and one for express cruisers. In addition there will be long distance ocean races for express cruisers from Miami to Nassau, Key West, and Palm Beach, and aquaplaning contests.

The detailed program is as follows:

FRIDAY, FEBRUARY 14TH

2:00 P. M.—Open displacement boats. Distance, 10 miles. No handicap. Qualifying speed, 20 miles per hour.

2:45 P. M.—Express cruisers. Distance 15 miles. No handicap. Qualifying speed, 20 miles per hour.

3:30 P. M.—Aquaplanes.

SATURDAY, FEBRUARY 15TH

1:30 P. M.—Open displacement boats. Distance, 20 miles. No handicap. Qualifying speed, 20 miles per hour.

2:30 P. M.—Express cruisers. Distance, 20 miles. No handicap. Qualifying speed, 20 miles per hour.

3:15 P. M.—Aquaplanes.

LONG DISTANCE OCEAN RACES FOR EXPRESS CRUISERS

Feb. 22nd, 9:00 A. M., Miami to Palm Beach Pier Head.

Mar. 1st, 9:00 A. M., Miami to Key West.

Mar. 8th, 9:00 A. M., Miami to Nassau.

A notable collection of trophies will be offered by the Miami Chamber of Commerce, aggregating more than a thousand dollars in value, and in addition cash prizes amounting to one hundred dollars will be offered for the aquaplaning events.

The Miami Midwinter Regatta annually brings to the fore some of the fastest racing in the world, especially in the class of express cruisers. During the 1918 regatta, the world's record for express cruisers was established by Shadow III, with a speed of 30.3 m. p. h.

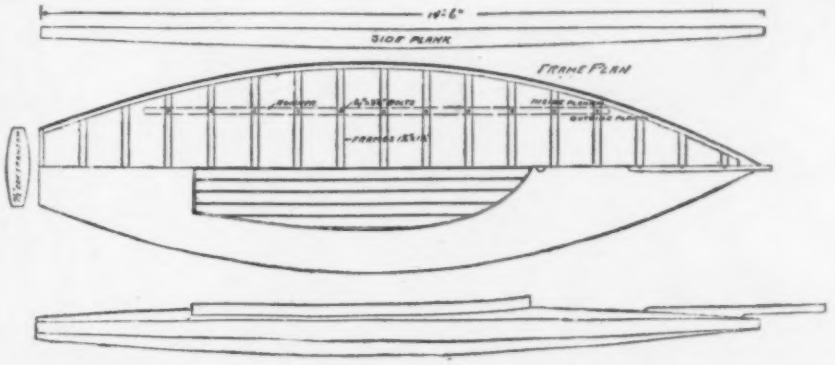
For the 1919 event, several new entrants will be in the field, a pair of high powered express cruisers now being under construction for Messrs. Harry C. Stutz and A. C. Newby of Indianapolis, by the Purdy Boat Works, of Miami Beach, Fla., builders of the record holding Shadow III. It is predicted that the new boats will be somewhat faster than the Shadow and consequently a new record may be set.

Another new entrant, in the open displacement class, will be Mr. H. R. Duckwall, of Indianapolis, who has a boat under construction that is said to promise exceptional speed.

The Miami Midwinter Regatta is one of the most picturesque events of the racing calendar, and invariably attracts a notable list of entrants. The course on which the race is held is one of the most unique in the world, being a perfect two-mile oval that is dredged to a uniform depth throughout, and so sheltered from the wind that racing conditions are practically perfect. The course is visible for its entire length to spectators from the shore, and the races in consequence are largely attended, winter visitors to Florida from every part of the United States being numbered among the spectators.

William H. Hand, Jr. Resigns from Government Service

THE Navy Department has announced its acceptance of the resignation of William H. Hand, Jr., from the formal position of Aeronautical Mechanical Engineer at the Bureau of Construction & Repair, Navy Department, Washington, D.C. Mr. Hand will still be available for consultation, but was relieved of official connection at his request because of the necessities of his personal affairs.



The hull is much like that of a gunning skiff and of about the same size

An Inland Cruise in 1918

Being a Pictorial Account of a Voyage Overland with the 53-Foot Schooner Virginia

VIRGINIA is an auxiliary schooner 53 feet long over all, 38 ft. 7 ins. on the water line, and has a beam of 17 feet, 9 inches. She is a huskey big boat built by Rice Brothers of East Boothbay, Maine, and is powered with a Standard motor. She was sold last fall to an "Up state" yachtsman through the office of Cox and Stevens.

I

AT Barcelonia, N. Y., on the shore of Lake Erie, an improvised marine railway was built and **Virginia**, with her spars, rigging and equipment on deck, or below, was hauled from the water.

THE third photograph shows the boat loaded upon the truck. She was handled stern first, the necessity for this being the long overhang of the bow which might have bumped the four large trucks which drew the boat overland and which are seen in another photograph.

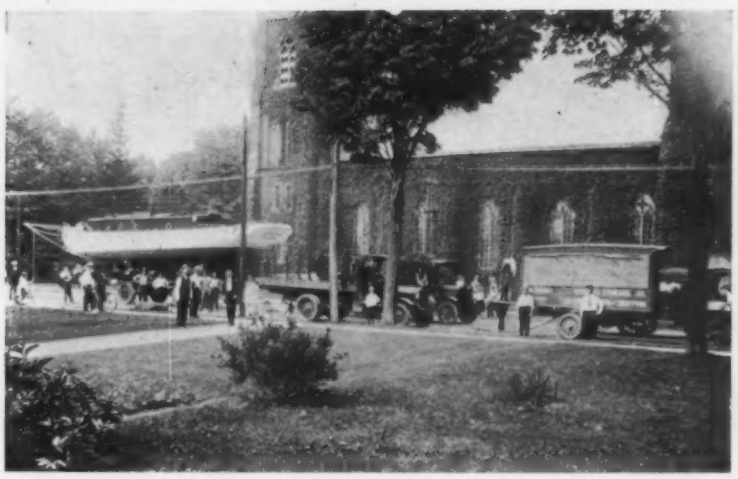
II

THE boat was moved on rollers a distance of three or four hundred feet until she reached the position noted in the second photograph. Attention is particularly called to the heavy truck in the foreground on which the boat was finally carried. This truck without anything on it weighed six tons and seven hundred pounds, and had carried a dead weight of 35 tons. The **Virginia** as she made the journey had an estimated weight of somewhere around eight or ten tons although it seemed at times like very much more.

III

IV

AS the state highway between Westfield and Mayville is only 18 feet wide and the boat of similar width it was only with great care and patience that the automobile traffic was not seriously hampered. The owner reports that the boat caused very little inconvenience. One street car had to wait twenty minutes, but outside of that the craft was not a public nuisance.

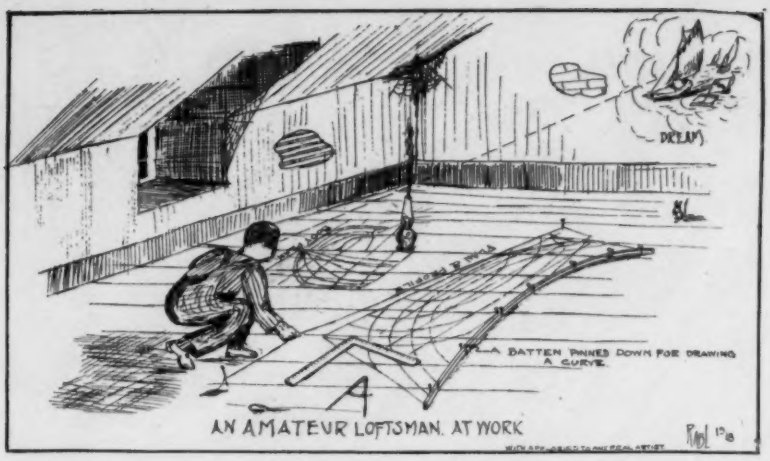


V

IT may not be amiss to mention that this photograph was taken upon Sunday and you will notice that the **Virginia** was in a very proper place for a picture to be taken on that day.

IT required 15 days of hard work from the time the boat was taken from the water until she was finally launched. It was found necessary to unload the boat once after it had been loaded at the beach owing to the possibility of a bridge not being strong enough to carry her. Also, from the beach to Westfield Village a distance of a mile and a half, more or less, the road had to be planked the whole distance to prevent the wheels from breaking through the highway.

VI



Lines and Their Use in the Building of Small Boats

S. S. RABL

YOU have often seen, in this and other publications devoted to yachting and shipbuilding, a drawing accompanying a design, termed the lines. A drawing which delineates the shape of the boat under discussion. Has it ever occurred to you the tremendous part that these lines play in the building of the ship? Would you think that the progress of civilization itself can be traced back through these depictions of a vessel's shape.

Compare the bulky form of the Roman galley with that of the ships of Columbus, and these in turn with the trim lines of the latest ocean greyhound and you are comparing the civilizations of these various eras.

Way back in the early days of shipbuilding, in the days when frames and planking were just superseding the dugout boat, naval architecture as we know it to-day was a science undreamed of. The early shipbuilder made a keel of some sturdy tree; upon this a stem and stern to suit his individual fancy were erected. He then made a mould of the shape he wanted his ship to be at midship, (note how at this early date the midship section was a controlling feature in the design). He probably also made a section or two between this and his stem and stern. Around these moulds he bent long strips of wood, altering his moulds if they did not run fair. His frames were then hewn out to fit these battens and his ship was planked. This method later was known as mocking up and is still used in some of the little tidewater shipyards of Maryland where the builders of some of the fastest boats afloat are hardly able to write their own names.

Some genius later discovered that the shape of a ship could be worked up from a series of parallel planes, these planes passing through his hull formed curved lines just as his finished ship would be shaped at her various drafts. We have no record of who this man was for lines were known even in the time of Peter the Great who is often called the father of the modern ship, and as we all know that was quite a few years ago.

Lines now are practically the same as they were in the days of the great Russian shipbuilder, but men have learned to use them to a greater extent. Nowadays they are used even to develop or work up the shape of the great steel plates which go into the shell of a modern steamship, almost every plate is worked up in template form from the body plan on the mould loft floor and perhaps it will fill you with pride to let you know that American loftsmen taught the world to use lines as they are used to-day.

Four types of lines are used to show the shape of a boat or ship. I will attempt to name them in the order of their importance.

Water lines are sections (they are not really lines but planes and the water line is the boundary of this plane) generally taken parallel to the water line that the boat is designed to ride upon. They appear as curved lines in the plan view, see Figure 1, and straight lines in the profile. To illustrate this, suppose we take a model of a boat. If this model is made of layers of wood that run parallel to the designed water line and taken apart, we will see that each layer is bounded by a curved line. This is the water line of the boat at this particular layer. Later I will explain how the shape of a boat may be obtained from a model alone without laying them down as the process of drawing them to full size is called.

Buttocks are like the water lines, sections through the boat, but at right angles to the water lines. In other words if our layers in the model ran parallel to the centerline instead of the designed water line their boundaries would be the buttocks.

Diagonals are sections taken at an angle to the centerline and are really the true shape lines of the boat. It often happens that a boat will appear perfectly fair on water lines and buttocks, but a diagonal will show an unfair line. Diagonals should always appear fair, for when these are fair, you can rest assured that water lines and buttocks are also fair.

Water lines are measured by their distance away from centerline at any given point. Buttocks are measured by their distance above the base line. Diagonals are also measured by their distance off center. Frame lines are generally the measuring point.

We have been dealing with longitudinal lines when we dealt with water lines, buttocks and diagonals. There is another set of lines formed by transverse sections through the boat, these are called frame lines, see Fig. 1. They are generally spaced as the frames in the finished boat will be spaced and they appear as straight lines in the Plan and Profile, and as curved lines in the body plan.

Several other lines go to make up the finished set of lines. The sheer or height of the deck, keel and stem with the outer edges of their rabbets and the transom are shown in the Profile. Deck line and half siding or half width of keel and stem and Plan View of the transom are shown in the Plan.

The Profile is a view of the boat just as we would see her if she were out of water and not distorted by perspective, in other words a true mechanical projection of all her heights.

The plan is a view as we would see the boat if she were turned upside down and we were looking directly down on her.

The body plan is a view as we would see her from the ends.

From the foregoing we have a working knowledge of lines. We have our Ideal Boat in mind. How will we determine the shape that we want her to be? To the amateur builder, the one who has never had any drafting experience, a wooden model is unquestionably the easiest way. For boats up to 25 feet, what the shipbuilders term scientific work or calculations may be ignored, this is, providing the boat isn't a radical departure from existing types. A model to insure accurate work should be made to at least a scale of 1½ inches to the foot. With a 25 foot boat this would mean a model 37½ inches long. A full model of any ship is never made unless it is to be a scale replica of the ship complete. A half model answers all the purposes needed for determining shape etc. Models for boats that are V-bottomed maybe made solid. Those from which we intend to build a sawn frame boat or one which would require a body plan full size, are generally made in layers, the thickness of these layers being the distances between the water lines that are intended to be used. The top layer is always made thick enough to take all the sheer that the boat has with a slight margin for trimming. Models built up in layers are always fastened so that the layers may be taken apart again to measure the water lines.

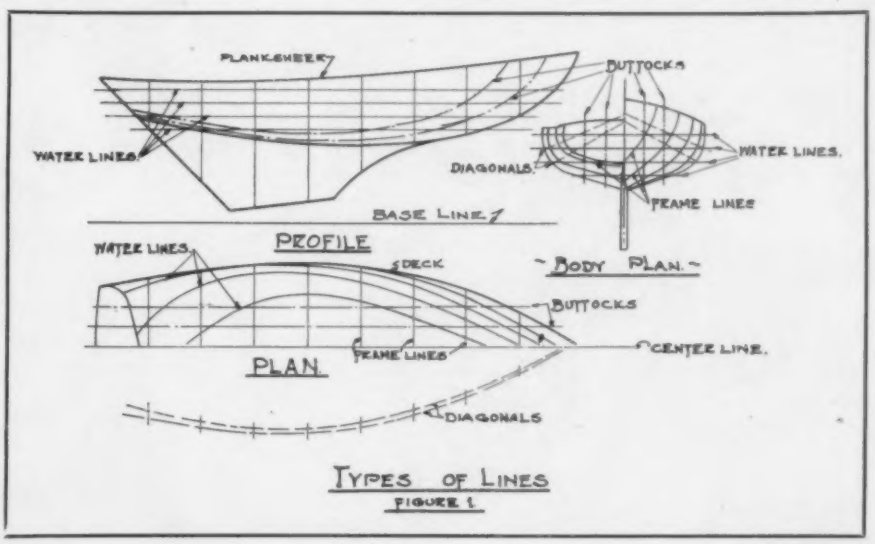
We will deal first with the making of a solid model. Suppose for instance, we wish to build a bent frame boat, twenty feet long, with a beam of six feet and a depth of 24 inches at midship and three feet at the bow. We will first determine the scale of the model if we can secure a piece of wood 5 feet long, 9″ wide and about 9″ deep the model could be made to 3″ to the foot scale. Always remember that the larger the scale the more accurate are our results for at 1½″ to the foot an error is multiplied eight times on the finished boat, at 1″ to the foot is multiplied twelve times and so on as the scale is reduced. These errors do not make themselves manifest in bent frame boats as much as in the sawn frame ones, because the ribbands fair themselves around the moulds. If we cannot secure the 5 foot piece of wood for our model or we consider it too bulky we can make the block 30 inches long and 4½ inches square. The large model would be used if very accurate moulds were required.

Sketch out the profile on the back of the model, see Figure 2, and the plan on its top. If the model is to have tumble home do not lay in a line as the deck would appear but one that will show the full width of the boat. Trim away all the excess wood as shown in Fig. 2 by the shaded portion of the plan. These sides should be left perfectly square. Do not attempt at this early stage to give the model any shape. The profile is in turn trimmed away in the same manner. We now have a boat which has a flat bottom and straight sides. A little template to scale may be made for the projection of the keep below the hull proper and also a template for the midship section. The keel template, see Fig. 3, may be applied throughout the model as far as we intend to keep our keel the same thickness. The midships template will be applied at midships only.

We may now begin trimming away the sides to the shape that we desire, always bearing in mind to give them easy flowing lines and ones that would not give too much bent to a plank. After we have roughed our model to the desired shape it should be sandpapered and scraped with broken window glass until all humps and hollows have disappeared. A rubbing down with steel wool or pumice will give us a smooth working surface. Too much care cannot be exercised in the finishing of the model. On this smooth finish will depend the accuracy of our moulds. If we intend to keep the model as a reference or ornament for the future she should be given a coat or two of good shellac and again rubbed down. Select a flat board that will leave about two inches margin around the model and mark off the length of the model on this. Divide this length into as many spaces as you intend to use frames or moulds and square off lines through these spaces across the board. Lay off a line at a convenient distance away from and parallel to the long edge of the board. Lay the model down upon the board with its keel resting on this line. With chisel pointed pencil of hard graphite trace the outline of the model upon the board taking very good care that the model does not move in this operation.

The model may now be removed and the heights of the keel above the base line accurately measured and recorded for future reference in building the keel. A few parallel lines will greatly help in measuring the stem and a line projected down to the base will give the rake of the transom. Just a few words regarding the making of measurements on a small scale. A draftsman's flat or triangular scale will be necessary to do this. These may be purchased for as low as fifty cents at any dealer handling supplies of this kind. You will note that the one inch to the foot and larger are the only scales that the inches are divided into quarters. This is another reason that small scales of length should not be used in making the model. In measuring a line if it comes directly in or close to the center of one of these quarter divisions we know that an eighth more than the quarter is shown. Therefore if the model is accurately measured the most that we can go wrong in a measurement is an eighth of an inch and on a wood boat this only a trifle.

After we have measured our models profile and recorded our results we may fasten it permanently to the board with some good quality of glue or small screws taking precautions that it exactly coincides with the outline we have marked before.



TYPES OF LINES
FIGURE 1

A box should now be made to saw the model through. This box is made similar to the ones that carpenters use to square off or miter the ends of timbers and should be made wide enough to take the model board. Be sure that the slots are should be spaced about 3 or 6 inches, (depending on the size of the boat) on the same scale that our model is made to. Slip this cardboard into the slots and mark off each section all around the model, marking each one for ready identification later. When a piece of cardboard against it and marking it off.

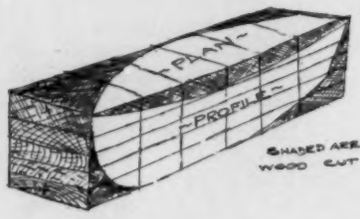
Lines as they are gotten from a model are to the outside of the planking and an operation called taking off, which I will describe later will have to be done to make the moulds.

Models built in layers are made in much the same manner as those of the solid type except that frame lines are squared across their back before any cutting is done. Their profile is obtained from a backing board the same as a solid model but when they are taken apart frame lines are squared across each layer from the marks on the back and each water line is measured. The top of each layer is always taken as the water line because it has a sharper edge than the lower ones. Care should be taken to protect these edges when the layers are taken apart, as a nick in them will mean an inaccurate measurement. Layers are sometimes made of dark and light woods alternately so that the shape of each waterline may be distinguished as the work of finishing progresses. This insures fairer lines. The measurements taken on each waterline should be recorded in a little table. The frames are numbered up and down some ruled paper, and columns denoting each water line ruled across them. This is called the table of offsets and the figures are always given in feet, inches, and eighths of inches, for instance one foot, six and three-quarter inches would read 1-6-6. Half widths of the deck may be measured across the top of the model's top layer.

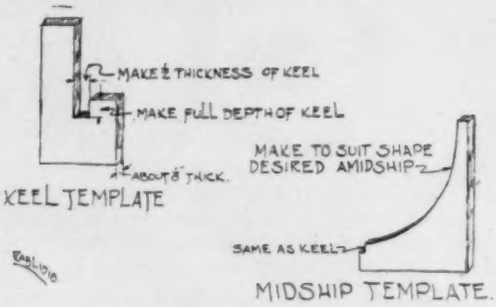
The more numerous the layers of a model, the more accurate the results obtained. Always be sure that your water lines or thickness of your layers are absolutely to scale. If they cannot be obtained so, make the water lines in your full size body plan correspond to what they scale on the model. The body plan as laid down on the floor is described later on.

When we have obtained offsets from a model and we wish them very accurate, or the scale of the model is so small as to leave a doubt about its accuracy an operation called fairing up is often resorted to. Fairing up boiled down is the laying down of the lines full size on a smooth floor and taking all the humps and hollows from them. Tables of offsets accompanying the designs that are published are very seldom faired ones, they were obtained from small scale drawings and often inaccurate. Fairing up makes these perfectly safe to work from.

It would be folly for me to attempt to describe fairing up without the preliminary preparations involved be-



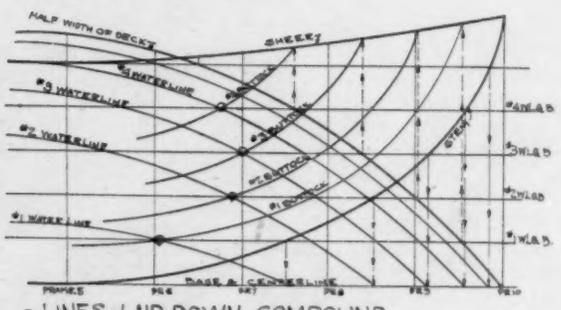
THE MODEL IN BLOCK FORM.
FIGURE 2



TEMPLATES FOR MODEL
FIGURE 3

THE writer wishes to express his sincere thanks to Messrs. Arthur Aldrich, George Horney and Albert Skeldon for the fundamental principles of the great art of fairing which they imparted to him while he was employed with them before and during the present emergency.

THE MODEL MOUNTED.
FIGURE 4.



-LINES, LAID DOWN COMPOUND-
SHOWING WATER LINES & BUTTOCKS CROSSING AND PROJECTIONS TO OBTAIN THEIR ENDINGS
FIGURE-5

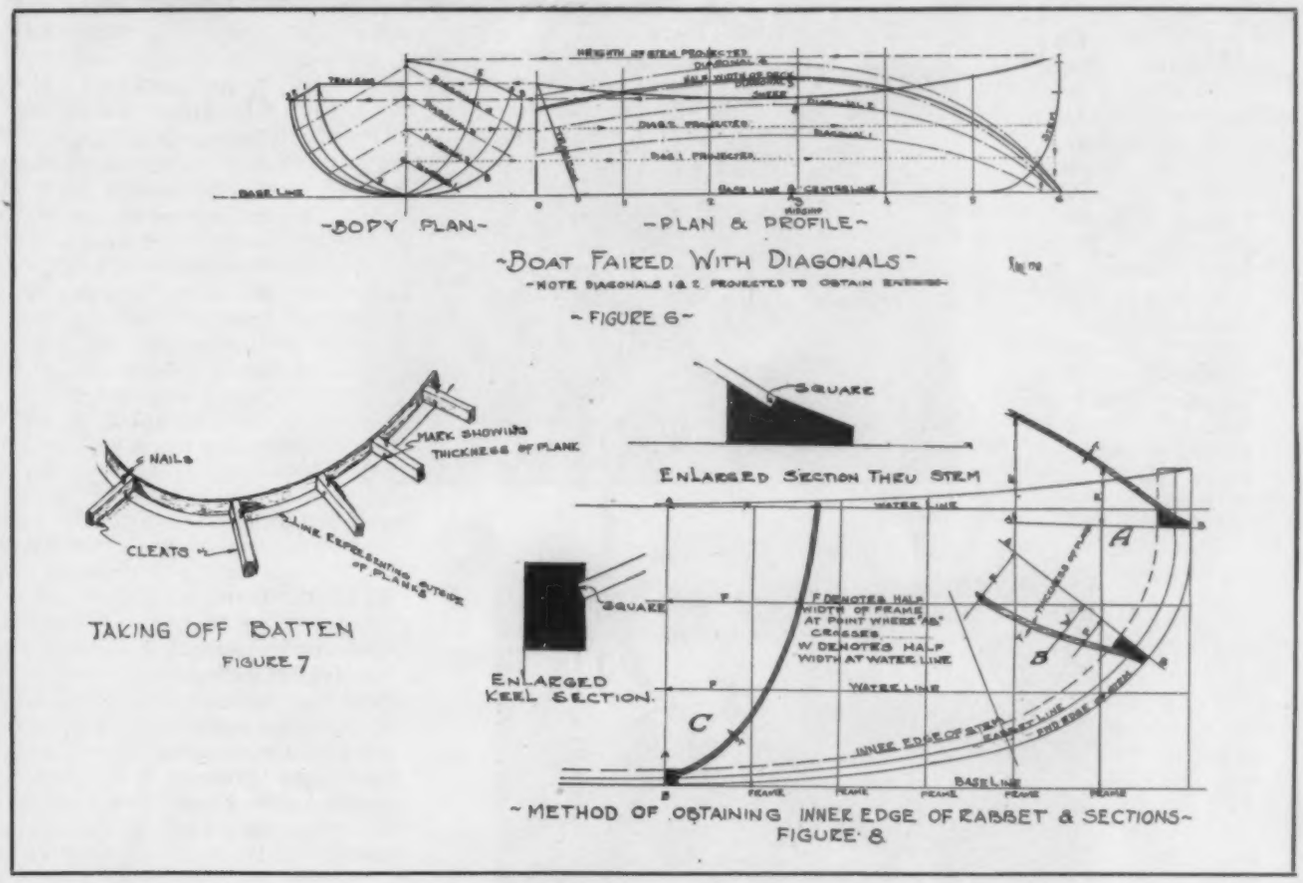
absolutely square with the frame lines on the model board and with a stiff-backed miter saw cut the model through to the board at every point where you intend to erect a mould.

Let us now take a piece of thin cardboard or veneer and square to one of its edges lay off some equidistant water lines. These lines all the sections are made, the widths on the water lines should be recorded for reference in making the moulds. The same point should be held on the base line for all slots. The lowermost water line is generally always held on the base line.

The shape of the transom can also be gotten from the model by laying

fore the fairing is done. A smooth floor at least big enough to lay out half the length of the boat and its greatest depth and half breadth will be necessary. The floor should be given a coat of either flat black or white paint so that chalk, soapstone or pencil lines will show clearly. A white floor is superior to the black inasmuch as it shows the pencil lines much clearer than a black floor will show chalk. It has one disadvantage, however, and that is, that pencil is much more hard to erase than chalk. Some big shipbuilding concerns paint their loft floors gray and others use a black floor with white spaces on this line which is serving a double purpose. When this condition occurs this part of the boat is fair as you will see later on.

After we have prepared the floor the next step is to lay out a perfectly straight line on it. This is done by driving a nail or awl in one end of the floor and at a place where we wish our line to terminate. A line such as masons and bricklayers use commercially termed chalk line is slipped over the nail or awl by first putting a loop in the end of it, the line having been well ribbed with chalk before-hand. The free end of the line is now held or fastened at the point where we wish



which the body plans are laid down, personally I prefer the latter. The amateur often cramped for room has to lay his three plans on top of each other. For accuracy I prefer to lay the plan and profile on the same space and the body plan a short distance away. The reason for this is that the base line in the profile becomes the center line of the plan view and all frame lines or stations as they are often called, will answer for both plans. The water lines in the profile also serve for buttocks in the plan, for instance, the 12-inch water line in the profile will be the 12 inch buttock in the plan. The 12 inch buttock rising to meet the sheer and the 12-inch water line converging to meet the center line will cross on it to terminate. After being tightly stretched, the line is raised about three inches and left go smartly. This operation has now transferred the line to the floor as an absolutely straight chalk line. A chalk line should never be snapped down in lengths exceeding 15 feet. If the line exceeds this length, divide it into two or three sections and have an assistant hold his finger on the line at the termination of each section while you hold yours at the other end and snap it.

With the base line down we have a working line. The base line will be either the full length of our boat or half her length according to the space we have on our floor. With a large steel square, or by any of the other many accurate means of obtaining square lines, a perpendicular is erected at the ends of our base amd the water lines spaced off on each of these as the layers were in the model or given in the table of offsets. Lines are now run between these points just as our base line was put down.

The spacing of the frames is now laid down on the base and the top water line and these points are connected after checking our end perpendiculars for squareness. One way to check them is to measure up on the frames four feet, and out on the base line three feet. If the lines are square, a diagonal line between these points will measure exactly five feet. This is called the 3-4-5 method of squaring and any multiple of these three numbers may be used.

After we have checked all our lines and found them correct they may be scratched into the floor with an awl or sharpened tongue of a file to preserve them.

The next step is to lay in our profile and plan views. This is done by laying off on each frame space the height and half width at that particular frame as given from the table of offsets or from measurements recorded from the model. A thin strip of wood called a batten is now bent through these points by putting a nail on each side of the strip, as

(Continued on page 42)

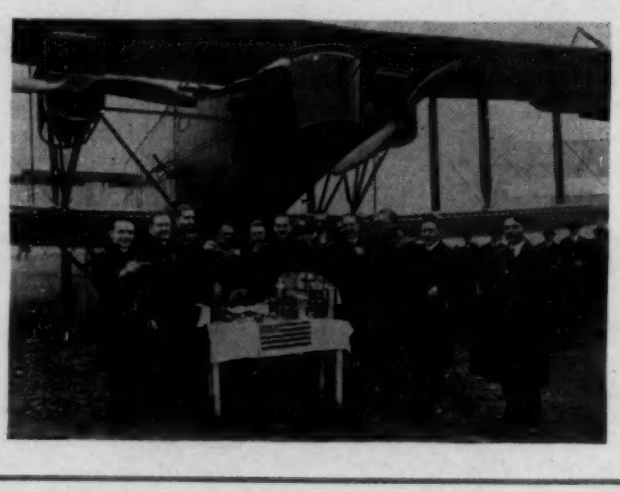
ALOFT WITH A TURKEY DINNER

FOR the first time, in all time, a genuine old-fashioned Thanksgiving dinner has been enjoyed in the nacelle of a rapidly flying airplane.

AFTER the flight, Capt. B. B. Lipsner (second from the left) received an honorary membership card in the Aerial League of America from Alan R. Hawley, President of the Aero Club. There are only four other honorary members of this League, President Wilson, General Pershing, Admiral Perry and Thomas A. Edison.

AROUND the table were Captain B. B. Lipsner (in fur coat), superintendent of the air mail service; Henry Woodhouse; Chas. H. Day, of the Standard Aircraft Corporation from whose field the flight was made, and Captain E. B. Waller the pilot.

BECAUSE of a dense fog that made navigation of the big Handley-Page flyer difficult, it was quite out of the question to secure any photographs other than this while the craft was in flight.



THE diners answered a toast just before going aloft. From left to right, those participating in toast, are Henry Woodhouse, Alan R. Hawley and Augustus Post all of the Aero Club of America; E. E. Pennewill, Vice President of the Standard Aircraft Corporation, builders of the big Handley-Page in which the dinner was held; Captain Benjamin B. Lipsner, Superintendent of the Aerial Mail Service; Chas. H. Day, E. J. Harting; Captain E. B. Waller, the pilot; J. M. Meirick; and Leroy Gullotta.

The Value of the Air Laboratory to Yachtsmen

By ALBERT ADAMS MERRILL, Throop College of Technology, Pasadena, Calif.

UNDER the stimulus of war much more progress has been made in the science of aeronautics in the last four years than was made in the previous eleven years. This has been due almost entirely to the able work done in air laboratories.

As yachtsmen may not know just what an air laboratory is I will give a short description of a common type of laboratory. The laboratory consists of a large room in which there is a long tube generally four feet square flared and open at both ends. At one end there is a large air screw driven by a motor, which screw sucks the air through the square tube at different speeds, generally about thirty miles an hour. The model flying machine is attached to a vertical spindle passing down through the center of the tube, through an oil or mercury seal, which spindle forms the vertical axis of a weighing balance.

The model is set with its span, that is the line from tip to tip of wings, vertical so that the air pressure across the wind corresponds to lift in a flying machine, and the pressure down the wind corresponds to drag or the resistance to forward motion.

Both of these forces are weighed by the balance. If the resultant pressure does not pass through the spindle there will be a couple about the spindle and this is also measured. From these figures it is possible to compute the lift, power required for a certain speed and the proper position for the c. g. to maintain the proper angle of incidence for the wings.

This, in brief, is the result obtained by air laboratories and it has proved of tremendous value for improving the design of flying machines.

Now the value of the air laboratory to the yachtsman lies in the fact that it is admirably fitted to test the efficiency of different sailing rigs. Such matters as the proper relation of boom, gaff, hoist and peak can easily be determined accurately and the C. P. of a rig can also be determined. The question of the proper flatness (camber we call it in aeronautics) of a sail can also be settled. For a four foot tube a model mast should not be over eighteen inches high. All kinds of rigs can be tested under all conditions of course and wind. In a sail boat it is what we call lift which, combined with the water resistance, produces a forward component which moves the boat ahead, while what we call drag, which in a flying machine has to be overcome by the screw, is a resistance which when added to the water resistance produces the total resistance which has to be overcome by the forward component of the lift. In a flying machine we have to consider only the two components upward and backward and most balances are built to measure only these forces, but with our balance at Throop it is possible to measure a component in any direction and this simplifies greatly the actual work of testing.

Of course all boats heel under the influence of the wind. This spills the air and reduces the lift component. This corresponds to a roll in a flying machine. In the model this could be cared for by mounting the mast on springs so that it also could heel, and a naval architect could figure out easily the proper strength for these springs in order that the model performance will correspond to that of a boat of a certain stiffness, which stiffness of course is a matter of lines and metacentric height. Some very pretty experiments could easily be made with model rigs if they were carefully and accurately constructed.

One thinks first, of course, of the value of such work for yacht racing, but one may get results of much more commercial value. It almost appears now as if the sailing auxiliary will supplant the old tramp steamer for handling some of the carrying trade. The use of wind and the gas engine seems able to give actually more speed than is common to the steam tramp and when we consider first cost, upkeep and running expense in terms of ton, mile, hour, it is possible the advantage will lie entirely with the auxiliary. If so the relative value of different rigs should be known and this can be determined accurately and quickly in an air laboratory. In aeronautics we are hampered by the fact that our tube speeds are not equal to our flying speeds so that we have to interpolate on the assumption that pressure varies as the square of the speed. This is probably not strictly true, especially when there is acceleration and so an error creeps into our figures. But for sailing, winds over thirty miles an hour are rare and thirty miles an hour is obtained easily in a tube.

Of course during the war, air laboratories were too busy with their own special work to consider the improvement of rigs, but from now on there is no reason why tests with model rigs should not be made. The models should be designed by some naval architect in cooperation with an air lab. man. Particular attention should be paid to the fact that the sails must be made of some very light cloth probably fine silk in order that their flexibility in proportion to their small area shall approximate the flexibility of a sail in proportion to its area.

If the yachting fraternity will take this matter up and build the models I feel sure that some of our research air labs. will make the tests free of charge and the only expense will then be the cost of the model. The value of the results obtained from such tests will more than pay such costs. An airplane model costs from thirty to fifty dollars but this expense is due to the great care necessary in forming the parts. No such care is necessary in model rigs so that for this amount of money probably five or six rigs could be made up.

Inter-Lake Yachting Association

THE 25th Annual Meeting of the Inter-Lake Yachting Association was held at the Toledo Yacht Club Saturday afternoon, December 7th, 1918. Commodore Huntington presiding.

Officers were elected as follows:—
Commodore, R. George Marsh, Grosse Pointe Yacht Club.
Vice-commodore, F. W. Wakefield, Vermillion Boat Club.
Rear Commodore, Fred Emmons, Sandusky Yacht Club.
Fleet Surgeon, Dr. P. C. Griest, Put-in-Bay Yacht Club.
Librarian, Frank R. Frey, Detroit Yacht Club.
Sail Yacht Measurer, C. F. Walbridge, Maumee River Yacht Club.
Power Boat Measurer, Dr. A. R. Hackett, West Detroit Boat Club.

Delegates to yacht racing union:—
S. O. Richardson, Toledo Yacht Club, Three years.
Otto F. Barthel, Detroit Yacht Club, Two years.
C. G. Jennings, Country Club of Detroit, One year.

Delegates to the A. A. U.:—
Charles D. Lynch, Detroit Yacht Club.
W. J. Billingslea, Maumee River Club.
F. W. Roberts, Cleveland Yacht Club.

F. W. Roberts of the Cleveland Yacht Club and Charles D. Lynch of the Detroit Yacht Club were re-elected members of the Board of Governors of the yachting fund.

Hugh B. Gunnison has been appointed secretary by Commodore Marsh.

Eighty-One Stars in the Service Flag of the Bayside Yacht Club

THE Bayside Yacht Club has a membership of 300 Seniors and 40 Juniors. Of these, 81 enlisted in the Service, which is about 1 in 4.

Of these 81, exactly 40 are Line Officers in the Navy or Commissioned Officers in the Army. Of the total number, 60 per cent are in active service on foreign soil or in foreign waters.

NAVY

Lieut. Walter L. Powers, U. S. N. M.
*Lieut. Frank L. Stiles, U. S. N. M.
*Lieut. Walter S. Dayton, U. S. N. R. F.
Lieut. Walter J. Lee, U. S. N. R. F.
*Lieut. Malcolm Mackenzie, U. S. N. R. F.
*Ensign Alexander W. Moffatt, U. S. N. R. F.
Ensign Donald Cowl, U. S. N. R. F.
*Ensign Walter P. Groszmann, U. S. N. R. F.
Ensign Norman E. Donnelly, U. S. N.
*Ensign Leonard E. Beard, U. S. N. R. F.
*Ensign Fred C. Smith, U. S. N. M.
Ensign John Adikes, 2d, U. S. N. R. F.
*Q. M. C. Lawson Willard, U. S. N. M.
Q. M. J. Paul Falconer, U. S. N. R. F.
*Q. M. Louis B. Warner, U. S. N. M.
*Q. M. Ferris P. Smart, U. S. N. M.
*Q. M. Edward G. Walsh, U. S. N. M.
*Q. M. Chas. H. Medicus, U. S. N. R. F.
Richard R. Walsh, U. S. N. M.
*Arthur Logan, U. S. N. R. F.
Chas. A. Gould, 2d, U. S. N. R. F.
*Anson G. Purchase, U. S. N. R. F.
Edwin Logan, U. S. N. R. F.
*Carlton Copp, U. S. N. R. F.
Wm. Nash Webb, U. S. N. M.
Harold C. Vause, Chief Engineer Naval Base
Richard Dorgan, U. S. N. R. F.
Bruce Aitchison, U. S. N. R. F.
*Bertram Darling, U. S. N. R. F.
Howard Keppel, U. S. N.
Oliver Alford, U. S. N.
Charles Norton Thomas, U. S. N. R. F.

MARINES

Val P. Fogh, U. S. Marine Corps
Sheldon Deardon, U. S. Marine Corps
*David H. Markell, U. S. Marine Corps
Edwin Shuttleworth, U. S. Marine Corps
†Charles B. Struthers, Jr., U. S. Marine Corps

ARMY

*Major George Sykes, U. S. Engineer Corps
Major Bradford Butler, Judge Advocates Dept.
*Capt. Edward C. Welsh, 58th Artillery C. A. C.
*Capt. George F. Miles, 20th Engineers
*Capt. F. G. Huntington, Aviation Signal Corps
Capt. Marshall L. Coleman, 152d Depot Brigade
*Capt. Charles T. Arrighi, Quartermaster Corps.
Capt. Wm. A. Kenyon, General Staff
*Capt. Edward B. Hine, Ordnance Corps
Capt. L. G. Peed, Motor Procurement
*Lieut. Walter M. Collins, 315th Infantry
*Lieut. P. W. Kerr, Ordnance Corps
*Lieut. Chas. M. Swezey, 307th Infantry
*Lieut. Frank H. VanWinkle, 407th Tel. Battalion
*Lieut. Van Wagenen Pingry, 104th Battalion Sig. Corps
*Lieut. Chas. H. Mellor, 107th Infantry
*Lieut. J. C. Chrisman, 407th Tel. Battalion
*Lieut. Philip E. Langworthy, 476th Aero Squad.
*Lieut. W. S. Hawkins, 107th Infantry
*Lieut. Claude G. Leland, 107th Infantry
*Lieut. Robert D. Boyle, Aviation Corps
*Lieut. Philip Benson, Aviation Corps
*Lieut. Francis Wakem, U. S. Infantry
*Lieut. Percy C. Hope, 308th Infantry
*Lieut. H. P. Rust, Canadian Engineers
*Lieut. W. W. Knowles, Quartermaster Corps
Lieut. Harry W. Everett, 107th Infantry
*Lieut. Howard R. Baker, Royal Flying Corps
Lieut. George P. Busch, Jr.,, U. S. Infantry
Sergt. Douglas Van Riper, Quartermaster Corps
†Corp. William A. Leonard, 107th Infantry
†Corp. Chas. B. Stone, 165th Infantry
*Corp. Henry K. Adikes, 165th Infantry
*Walling E. Harvey, 23rd Engineers
†Roland E. Phillips, 165th Infantry
*Thomas F. Herrick, 102d Field Signal Battalion
*George J. Gillies, 107th Infantry
Lewis A. Hallock, U. S. Light Artillery
*George Frey, 58th Artillery C. A. C.
George W. Shields, 20th Battalion Infantry
George I. Barber, 67th Infantry
David H. Woodruff, Signal Corps
*Frederick G. Randall, Y. M. C. A. Director
*Charles L. Willard, Y. M. C. A. Director

*=Foreign service †=Killed in action

THE Bayside Yacht Club is of the opinion that this record is unbeaten by any Yacht club in the country. Now that the fighting abroad has ceased they offer a friendly challenge asking any other Yacht Club in the country to beat it.

Some Details of Light Planking

Being extracts from a booklet, published by L. W. Ferdinand & Co., Manufacturers of Jeffery's Marine glue, on sea-plane float construction, in which is contained much authoritative information on the subject of super-light construction which is applicable for yacht building as well as for the creation of aircraft.

CHARLES G. MacGREGOR

THERE is a wide choice of methods of planking, but for good all around service the double skin diagonal is the most serviceable and durable.

Planks under ¼ in. thick should never exceed 6 in. in width, and under ⅛ in. thick should never exceed 4 in. in width. If made greater than these

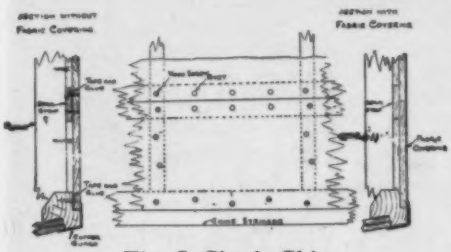


Fig. I. Single Skin

widths they are very liable to check and split with the constant wetting and drying to which they are subjected under service conditions. Each plank is made in one length where possible, because each butt or joint is likely to be a weak point and means the addition of more weight to the float. When drilling holes for the fastenings in very thin planking a countersink is not necessary for the head of the fastening, as it draws in flush when it is riveted, particularly in the soft woods.

The following are brief descriptions of some of the methods of planking most commonly used and proved to be very satisfactory in actual service. These are divided into groups for location, and are further subdivided into types, as follows:

GROUP 1. TOPSIDE PLANKING

A, Single Skin with Seam Strips.

B, Single Skin with Seam Strips—Fabric covered.

C, Double Skin Inner Diagonal, Outer Fore and Aft—Fabric between.

D, Double Skin Inner Diagonal; Outer Diagonally opposite—Fabric between.

E, Three Ply Laminated Wood.

GROUP 2. BOTTOM PLANKING

A, Single Skin with Seam Strips.

B, Double Skin Inner Skin Diagonal; Outer Skin Fore and Aft—Fabric between.

C, Double Skin Inner Skin Diagonal; Outer Skin Diagonally opposite—Fabric between.

D, Treble Skin, Inner Diagonal; Intermediate Diagonally opposite; Outer Fore and Aft—Fabric between all skins.

E, Three Ply Laminated Wood.

Each group will now be treated individually and a brief description of the methods of planking, some of the troubles met with and what to look out for during the various operations:

GROUP 1. A, Single Skin with Seam Strips (Fig. 1). This method is used mostly on the topsides of the flatbacks without any covering other than the varnish or the paint. Most of the planks are straight or have a very slight curvature on the edges. Before the plank is fixed down a strip of tape or canvas saturated with water proof liquid marine glue is laid along the seamstrips and rabbets below the edges of all planks, so as to make the joint watertight. The fastenings are spaced about 1½ in. apart on the seam strips and about 2 in. apart on the frames. They are not less than ¼ in. in from the edge

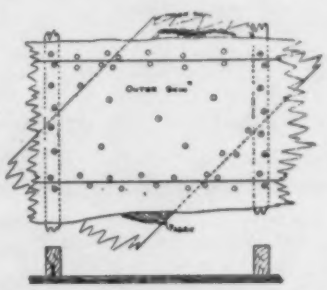


Fig. II. Double Skin Diagonal and Fore and Aft

of the plank. Fastenings are staggered where possible to avoid the chances of the wood splitting between them. When turning over the point of the rivet on the inside of the seam strip, each is turned to the right and left alternately for the same reason as stated above. The heads are filed flush when finishing the planking on the outside.

GROUP 1. B, Single Skin with Seam Strips, Fabric covered (Fig. I). The only difference between this type of planking and the preceding one is that tape and glue are not used under the plank seams, as the fabric which is stretched over the outside of the planking keeps it all watertight. (See "Fabric Covering.")

GROUP 1. C, Double Skin Diagonal and Fore and Aft—Fabric between (Fig. II). This method of planking is one of the strongest, and is used in both topside and bottom construction. The inner skin is in narrow strips about 4 in. wide, run from the keel out and forward to the chines at an angle of about 45 deg. These planks are fastened at intervals to the frames, etc. Sometimes they are run right across the bottom from chine to chine in one piece without being cut at the keel. When used in topsides construction they are laid continuously across the back from chine to chine. After the whole of the inner skin is completed, the fabric is then stretched over it as described under "Fabric Covering," and on it the seams of the under skin are marked with soft pencil, so that they can be easily located when drilling the holes for the fastenings on the outer skin. The outer skin runs in a longitudinal or fore and aft direction. The fastenings are arranged as shown in diagram. It will be noticed that they are staggered for both inner and outer skins. When drilling these holes for the fastenings, a metal jig is made for one frame space, this will work in for most of the frame spaces and will facilitate the work. The plank widths are kept as uniform as practicable, as this simplifies the work considerably. The bottom planking can quite profitably be built up on a form or mold the exact shape of the bottom of the float. On this form all keelsons, floors, etc. are marked. The inner skin is laid first and tacked at the outer ends only, which should be left about ½ in. longer than required. The fabric is stretched over, the outer skin laid, and all the fastenings are driven right through. The whole is then lifted off the mold, turned over and

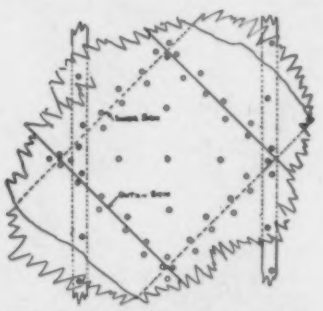


Fig. III. Double Skin, both Diagonal

the ends of the rivets are turned down. The bottom planking is now placed on the upturned float bottom, fitted between chines and finally screw fastened to the floors and stringers. This method of building the bottom planking is found to be

the best, because if the planking is built right on to the float bottom, trouble will be experienced in riveting the fastenings on the inside, in fact, in certain float construction it is almost impossible to build with rivet fastenings, and wood screws have to be resorted to for fastenings. When single topside planking is used, one or two of the planks are left off for access of the arm when riveting the bottom, and are screwed on when the planking is completed.

GROUPS 1-D, 2-C, 3-B, Double skin, both diagonal (Fig. III). This method is much stronger than the foregoing on account of the grain of each crossing the other at about 90 deg. instead of 45 deg. Each layer is laid at about 45 deg. to the keel, and in opposite directions, so that the seams and grains cross. This method requires a very large number of fastenings; these are best arranged as shown in diagram. Only the very best lumber is used because the outer skin has no fabric covering, and is therefore exposed to the sun and weather. Great care is taken in the fitting of the seams on the outside. All planks are made about the same width and each plank is in one length.

GROUP 2. D, Treble Skin. (Fig. IV). This is seldom used in float construction, but is worth describing. It is very strong, but is much too heavy for the small size floats used at present. The method is the same as for double skin, both diagonal, with the addition of another layer of fabric and another layer of planking over all. The seams of the two inner skins are marked on the second or outer fabric. Each skin is very thin

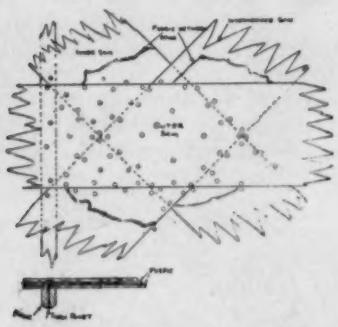


Fig. IV. Treble Skin

and therefore requires the most careful and skillful handling.

Another type of multi-skin construction is that shown in Fig. V. The layers of planking are glued and ironed together with silk between, and then instead of being riveted they are sewn together with bronze wire. The wire is let in flush with the outside surface of the planking. No frames are required but longitudinal stringers are used to stiffen the hull. This makes a very neat and pretty job if properly and carefully executed, but is very expensive on account of the enormous amount of labor necessary.

GROUPS 1-E, 2-E, 3-A, Three Ply Laminated (Fig. VI). This material is made up in sheets about 60x42 in. It is made by gluing three layers of veneer together with waterproof glue under pressure. The inner layer is thicker than the outer skins, and sometimes they are made with all three skins equal in thickness. The grain of the inner runs opposite to the outer grains, thus making a very strong and rigid construction. It is invaluable in the construction of bulkheads and wing floats, planking and framing. The edges are liable to splinter if not protected, and in some inferior quality of this wood the layers blister and come apart, because of the glue giving way under ordinary service conditions.

WOOD FOR PLANKING

The most common varieties are mahogany, white cedar, white pine,

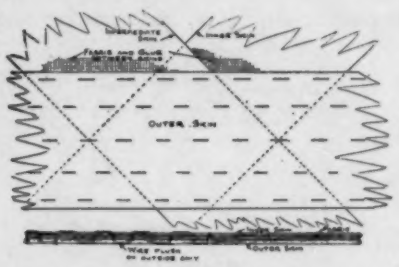


Fig. V. Saunders' Sewn System

spruce and Spanish cedar, when this latter is very carefully selected.

FASTENINGS

For planking of the thickness used in these floats, the best fastenings are brass and copper rivets, in preference to wood screws; they hold better, can be driven in and have the ends turned over just as fast as a screw can be driven, and will not loosen up so readily. Wood screws, if driven too hard, will strip the thread in the wood and thereby render it useless as a fastening. On the other hand, screws can be used to much more advantage than rivets for attaching the planking to frames and stringers.

The rivets are known as Canoe rivets, varying in length from $\frac{3}{8}$ in. and upward. When long rivets are used through stringers, etc., a washer or burr is used to rivet the end over. The rivets through the planking and seam strips are spaced from $1\frac{1}{2}$ to 2 in. apart; the thinner the wood the closer is the spacing. All wood screws used in planking have flat heads and are brass.

FABRIC COVERING

The material used for the covering of floats either between the layers of planking or on the outside of the planking must be very strong, light but not too thin, with sufficient body in it to hold the "Liquid" marine glue with which it is saturated when being applied. Linen covering used on wings has been tried and found to be very suitable for the lighter types of floats, such as scout

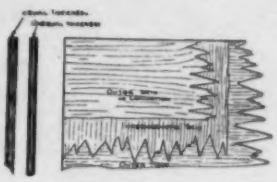


Fig. VI. Three ply Terminated

machines; but it requires proper and careful handling. For the larger floats a heavier material is recommended. Only the very best marine glue is used for this work.

The finishing room, where varnishing, painting, gluing, etc., are done, is kept at an even temperature of not less than 65 deg. F. and not more than 80 deg. F. It is dry and kept well ventilated, so that the fumes are quickly carried off and the process of drying facilitated.

*Before anything is applied to the planking, it is thoroughly and carefully sandpapered to a smooth finish and then brushed off. One thin coat is then applied hot to the planking. When in use the hot glue is maintained at the proper temperature by keeping the glue pot surrounded with boiling water; or a branch pipe may be led from the steam pipe of the steam chest if this is convenient. The glue itself is never allowed to boil or it will become hard and brittle when cool; it must maintain its elasticity when set.

The fabric is stretched in one piece wherever possible, with plenty of allowance along the edges and on the ends for gripping by hand when stretching it over the float.

Before the fabric is stretched over, the float is given another coat of glue, sparingly but thoroughly applied over the first. This and the stretching are done very rapidly, as the fabric must be in place before the glue sets and hardens. The fabric is held about one foot above the float lengthwise and is pulled taut, then while being held out on each side at

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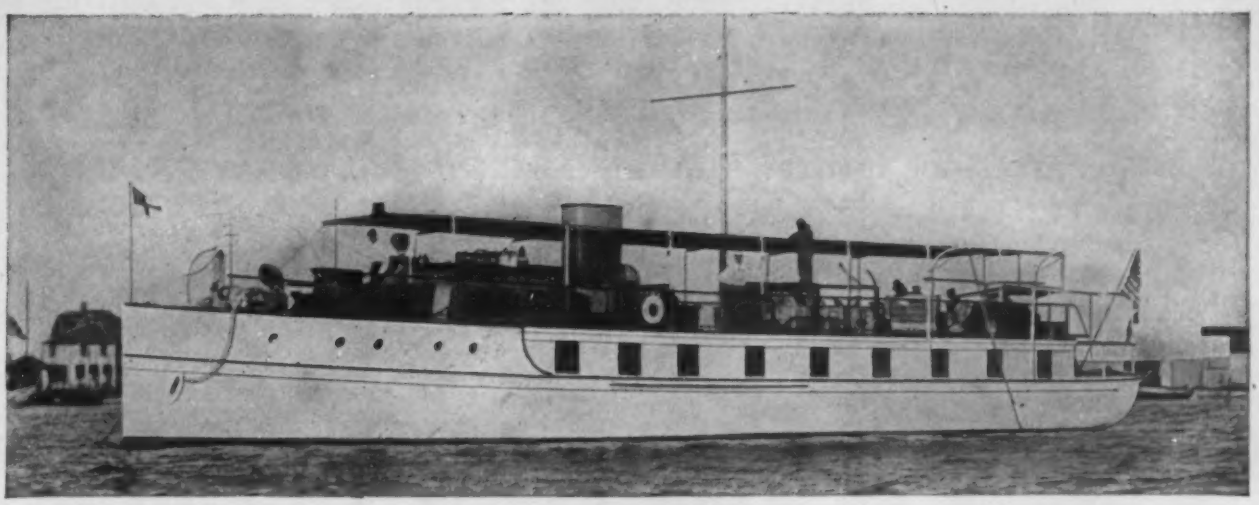


Mathis-Built Houseboats

The feature of every Florida season

Each year since 1910 has seen Mathis-Built Houseboats the center of attraction in Florida water.

Though we have been working 100% on government work during the war, this leadership still stands unchallenged.

There is a reason why Mathis-Built Houseboats are the choice of such men as

A. P. ORDWAY MURRAY GUGGENHEIM H. N. BARUCH
GEORGE W. PERKINS W. J. MATHESON HENRY W. SAVAGE
and other notable New Yorkers
L. H. *and* A. W. ARMOUR *and* JAMES DEERING, *of Chicago*
and others "who know"

A typical 43 ft. Semi-houseboat
easily handled by one man. The roomiest, seaworthy boat of this size ever produced

We shall gladly explain that reason, to any man interested in houseboats or semi-houseboats.

Or estimate on your architect's plans for that new boat.

Mathis Yacht Building Company

Specialists in Houseboats and Cruisers from 40 to 120 ft.

Front and Erie Streets Camden, N. J.

A-1 Equipment For Yachtsmen

BEING some odds and ends of equipment that will give service to the man who goes afloat for recreation.

A MESS KIT

ESPECIALLY aboard the smaller yachts a Theroz mess kit is invaluable for it provides the quickest and cleanest way of cooking. There's no bother with liquid food, no waiting; just a match and a Theroz mess kit.

A GEM RAZOR OUTFIT

COMPACTLY arranged in a khaki case a Gem razor outfit is a useful bit of personal equipment to carry along on a cruise.

A SHEATH KNIFE

MANY emergencies arise when one is afloat where a well made and correctly tempered sheath knife is indispensable. The one illustrated, which is a fine one, is made by Marble.

A SANITARY CASE

Size. 13" x 9½" x 4"

AN In-Good metal case, finished to have the appearance of a leather hand bag, is just the thing in which to carry lunch while off for a day's sail.

A FIRST AID KIT

EVERY yacht should carry a first-aid kit. Johnson's is a practical and complete outfit of this kind.

A MOTOR FOR THE TENDER

TWO of the many appealing virtues of the outboard motor is that all motor installation troubles are eliminated and the craft, from bow to stern is clear of propelling machinery.

These two advantages alone put this type of motor in the wonder class. Among the better of them is the Caille.

A HANDY AXE

ALL the water men should include in their equipment, especially while cruising, a well selected set of tools — among these a small axe has a very definite place.

"STANDARD" Postal Planes Make Remarkable Record!

In the four months during which the fleet of special postal-planes, designed and built by the Standard Aircraft Corporation, has carried the air-mail between New York, Philadelphia and Washington, more than four hundred flights have been made and only nine of these have been interrupted for any reason whatsoever. Six of these interruptions resulted in negligible delays, and the other three held up the mail for only an hour or two.

This is a record for reliability of which the best train-service would be proud.

For peace-time duty as in war-time service, "STANDARD" Airplanes have proved their superiority.

Member of Manufacturers' Aircraft Association, Inc.

STANDARD AIRCRAFT CORPORATION

ELIZABETH NEW JERSEY

For the Skipper's Book Shelf

THE work of the British M. L.s in their year after year patrol of war zone waters is well and entertainingly told in the little volume *Pushing Water* written by Eric P Dawson, Lieutenant R. N. V. R.

The book reveals a phase of warfare of which the world knows little or nothing. As the writer puts it, when the war is over, and one man recounts the thrilling adventures of the Somme, and another the triumphs of the Marne, all that he and his brother officers will be able to report is that for four years they "pushed water."

John Lane and Company are the publishers of *Pushing Water*.

✿ ✿ ✿

THE revised edition of the *Hand Book of Ship Calculations, Construction, and Operation* by Charles H. Hughes is a book of great interest and value to those interested in naval architecture, marine engineering, or ship and yacht building and their operation.

Its 700, and more, pages are replete with a broader collection of practical data than may be found in any other work devoted to the design, creation and maintenance of craft of the sea. D. Appleton and Company, New York, are the publishers of Mr. Hughes' excellent hand book.

✿ ✿ ✿

A VERY interesting book is *The Fighting Fleets*, written by Ralph D. Paine and published by Houghton, Mifflin Company. Those chapters describing the work and experiences of the American destroyers in their ever watchful hunt for the elusive U-boats is especially good. The book is in its entirety a most picturesque and accurate story of the work of American seamen in the Great War.

✿ ✿ ✿

MODERN Shipbuilding Terms, by F. Forrest Pease is the first American publication to completely define and illustrate with actual photographs the various parts of ships and ship machinery.

These photographs show the progressive steps in the construction of ships. The illustrations in nearly every case are taken from ship building, and the arrangement is such that if studied in order they will give a thorough idea of the modern method of shipbuilding. While all words and phrases now used in connection with shipbuilding are very thoroughly defined, the worker needs this book to know just how every operation looks in process and finished. It helps in reading blue prints. It explains the relation of work on parts to the completed ship. Essential to both yard and office men.

J. B. Lippincott Company, Philadelphia, are the publishers of *Modern Shipbuilding Terms*.

✿ ✿ ✿

THE Boston Transcript says that *The Odyssey of a Torpedoed Transport* is "By far one of the most interesting publications that has come out of the present war. It is interesting from any number of angles; it is, in a genuine sense of the phrase, a human document written with a verve that carries the reader on from letter to letter with an eager haste that at times becomes breathless."

No hint is given in the letters that form the text of this volume as to who their author is beyond a capital "Y." The book was translated from the French for Houghton, Mifflin Company, Boston, its publishers, by Grace Fallow Norton.

✿ ✿ ✿

LANDS END is a volume of fascinating short stories of the Portuguese fishermen of Cape Cod. The passionate heart of the sea pulses in all ten of these down-on-the Cape tales written by Wilbur Daniel Steele and published in a volume which comes from the press of Harper & Brothers, New York.

✿ ✿ ✿

SOLDIERS of the Sea, by Willis J. Abbot is the authoritative story of our crack fighting corps, the U. S. M. C., from their exploits under Decatur down through their experiences in our own day in the Bahamas, the deserts of Africa, Tripoli, the Fiji Islands, Japan, China, the Philippine Islands, the Arctics, the South Seas, Nicaragua, Haiti and wherever duty has said, "Go!"

Dodd, Mead & Company, New York are its publishers.

✿ ✿ ✿

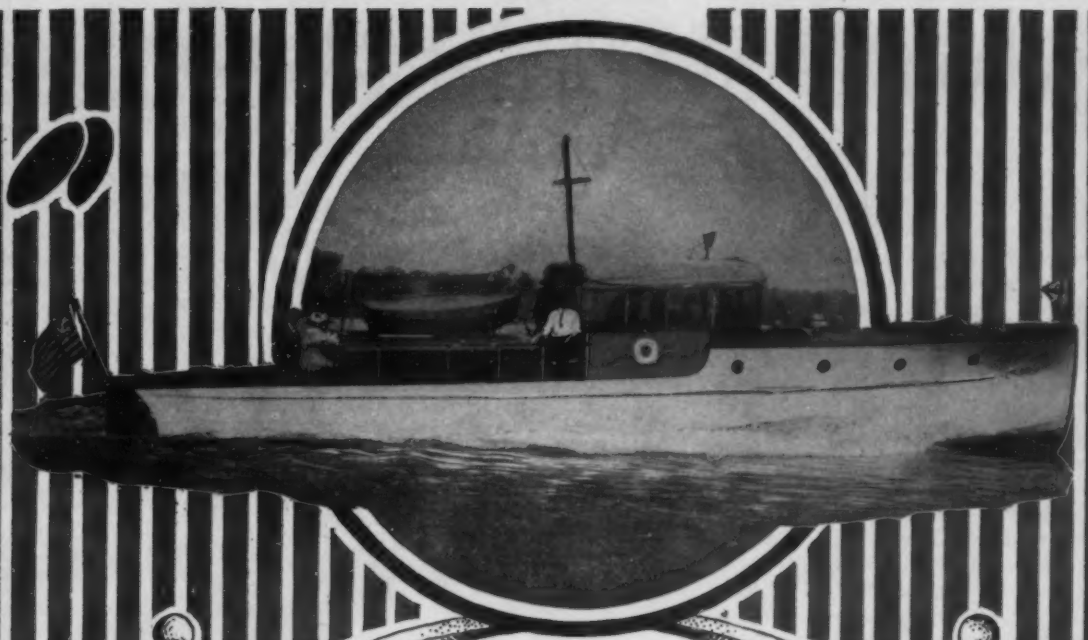
THE host of readers who have absorbed Admiral Mahan's famous works will welcome *Sea Power and Freedom* by Gerard Fiennes and published by G. P. Putnam's Sons, New York, for by a review of naval history prior to 1660 and subsequent to 1783, the limiting dates of Admiral Mahan's investigation, it confirms the importance of the role played by sea power in the affairs of the world.

The volume carries the reader from the earliest recorded maritime expedition—that of the last Pharaoh of the Eleventh Dynasty—to the great, and minor naval actions of the present war.

The author shows that the possession of sea power depends on a national character which is, in itself antagonistic to despotic rule.

✿ ✿ ✿

The Sachem's Head Yacht Club is ideally situated on a land locked harbor which is one of the most picturesque on Long Island Sound



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WE are now in position to concentrate our entire resources on the building of the Great Lakes Standardized Express Cruisers.

"Miss Liberty," shown above, owned by Mr. H. Birge, Buffalo, N. Y., is one of our Fifty-two Foot Standardized Express Cruisers, typifying the utmost obtainable in a cruising motor boat.

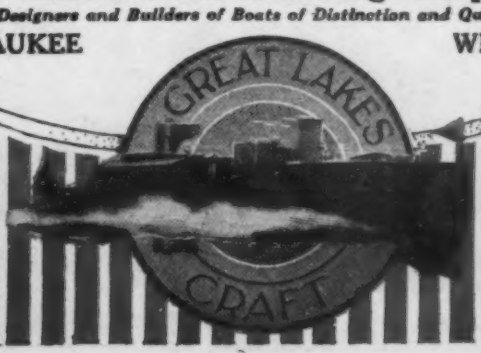
Completely equipt in every detail, designed and built to the highest possible standards, incorporating the wealth of experience gained by our designers, this Standardized Boat offers an ideal opportunity to IMMEDIATELY become the possessor of an Express Cruiser which comes up to your every expectation.

Write or wire for full details—we are in a position to accept contracts for exceptionally early delivery.

Great Lakes Boat Building Corporation

Designers and Builders of Boats of Distinction and Quality

MILWAUKEE **WISCONSIN**



A 30-Foot Auxiliary Motor Fishing Boat

NO, the splendid little craft, the drawings of which are shown herewith, is not a yacht: her make-up entire, however, is so pleasing, and there is that about her which bespeaks so much of the sea that she is interesting.

Rearranged as a yacht, eliminating of course the fish hold, the craft would be an able cruiser.

Among other things, W. C. McBryde, her designer, says in *Motor Boat and Motor Ship*, England, from which the plans are reprinted: "Perhaps one of the most profitable businesses at the present time is to be found in fishing, and one in which the prospects for a considerable time to come are excellent, and it is also a means of increasing the food supply during the crisis which we are passing through. Enormous profits are being made even with comparatively small fishing boats, both sail and power. The auxiliary or full-powered fishing boat has advantages over the sailing boat, especially in calm weather or for trawling purposes. The motor has, therefore, enabled the fisherman to greatly increase his profits.

"The auxiliary fishing boat reproduced herewith will no doubt be of interest to many who contemplate the construction of such a craft.

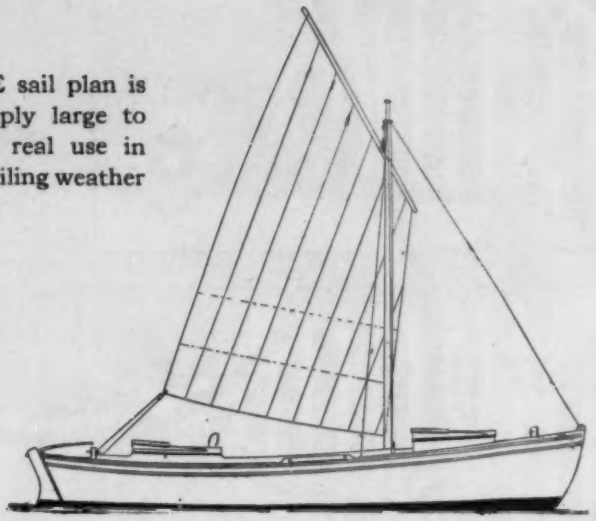
"The vessel is of a seaworthy type for inshore fishing and for an occasional run off shore, and will be suitable for hand lining, long lining, mackerel fishing, and would also be suitable for lobster potting and trawling during the proper season. The general dimensions are as follow:—Length overall, 30 ft.; beam, 8 ft.; with a draught of about 2 ft. 6 ins. The comparative light draught will enable the vessel to be used at almost any port.

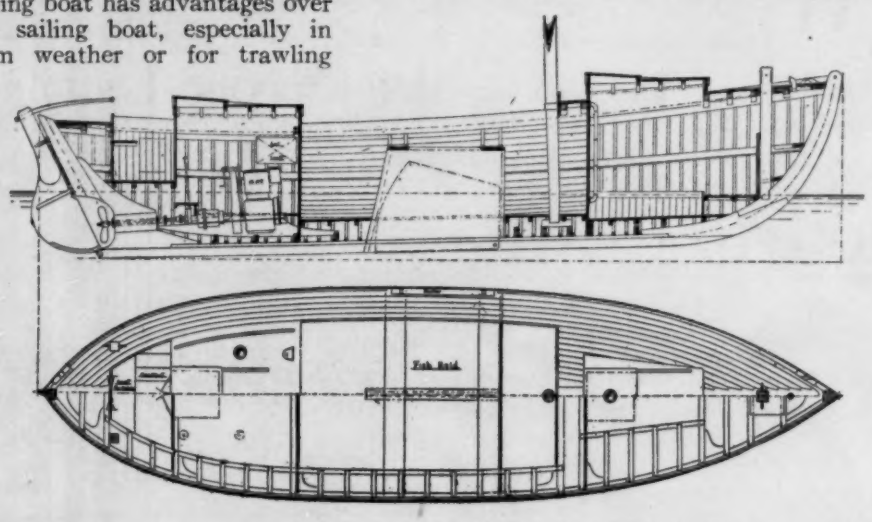
"The boat has a 10 h. p. paraffin motor fitted well aft under a raised roof, which gives good headroom. This power is sufficient to drive the boat at a fair speed, which speed can be greatly increased by the use of the lug sail in favourable winds, a centreboard is fitted to enable the vessel to go to windward. The engine-room is entered from a small cockpit aft, and from which the vessel is controlled.

"Accommodation is arranged forward, also under a raised cabin roof, and has about 5 ft. headroom, which is quite good for a vessel of this size and type.

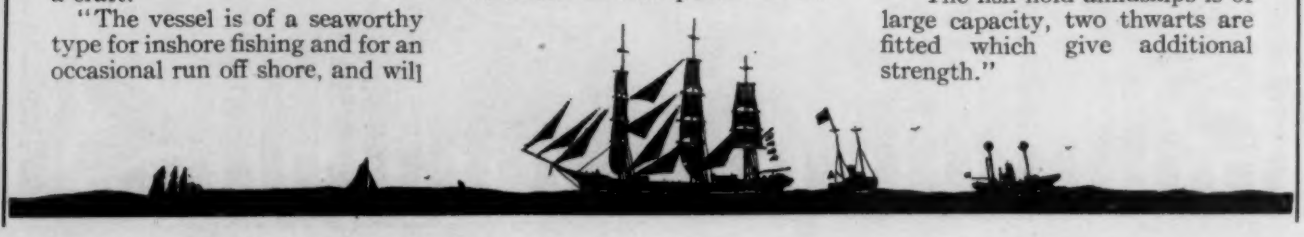
"The fish hold amidships is of large capacity, two thwarts are fitted which give additional strength."

THE sail plan is amply large to be of real use in any sailing weather





THE boat laid out in the drawing is intended wholly for use as a fishing vessel. Easily though, we can visualize how well she might be laid out as a pleasure craft.



How many M. P. H. is your boat making?
How many R. P. M. is your propeller turning?
At what temperature is your motor operating?

MASTERS BOATMETERS to indicate to 16, 24 and 37 M. P. H.
CORBIN TACHOMETERS to indicate 500, 1000, 2000 and 3000 R.P.M., and BOYCE MOTOMETERS (distance type) for motor boats, answer these questions at a glance, accurately.
Masters, Corbin, Boyce—each name stands for quality, proven accuracy and reliability, such as you want in the instruments on your boat. Telephone, write or call for full information.

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Steering Gears
and* MARINE FITTINGS *for
Power and Sail Yachts

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Established 1859

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Ideal Golf Climate—October to May

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AUGUSTA, GEORGIA

Twenty-four Hours from New York
Thirty-six Hours from Chicago

••

Near two finest Eighteen-Hole Golf Courses in the South

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Thru Train Service from North and West
On Main Auto Routes

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Desirable Clientele—American Plan

Complete Marine Equipment

MARINE HARDWARE AND ACCESSORIES
YACHT SUPPLIES RACING SAILS
CAMP FURNITURE
TENTS FLAGS
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COTTON DUCK
SAIL AND AWNING MATERIALS

GEO·B·CARPENTER & CO.
CHICAGO 202 W. AUSTIN AVE. ILLINOIS

Curtiss Motor-Boat Water Closets

Figure 1404

A NEW IMPROVED MOTOR BOAT CLOSET

Dimension, 18x18x11" high to top of bowl, 2½" cylinder. For above or below water line.
The best little closet on the market today, possessing many of the advantages of the large size toilet. All brass and porcelain. Oak seat and cover.

"All prices subject to market advances, which are continually changing"

Manufactured Solely by
THE J. H. CURTISS CO., 2 South St., New York

Concerning the Motor Boat Show

OPTIMISM as to the immediate future of the motor boat industry was the real keynote of the Executive Committee meeting of the National Association of Engine & Boat Manufacturers held Thursday, December 12th. The question of whether or not it would be good policy to hold a National Motor Boat Show in New York City in 1919 was, of course, the chief topic under discussion. The meeting was exceptionally well attended, the following directors being present.

Henry R. Sutphen, the Elco Works, Bayonne, N. J.
John J. Amory, Gas Engine & Power Co. and Chas. L. Seabury & Co., N. Y. City.
Percy C. Jones, The S. M. Jones Co., Toledo, Ohio.
Charles A. Criqui, Sterling Engine Co., Buffalo, N. Y.
James Craig, James Craig Engine & Machine Works, Jersey City, N. J.
H. H. Brautigam, The Bridgeport Motor Co. Inc., Bridgeport, Conn.
Walter L. Fay, Fay & Bowen Engine Co., Geneva, N. Y.
George F. Lawley, Geo. Lawley & Son Corporation, Neponset, Mass.
A. E. Luders, Luders Marine Construction Co., Stamford, Conn.
W. C. Morehead, Great Lakes Boat Building Corp., Milwaukee, Wis.
A. E. Robinson, Regal Gasoline Engine Co., Coldwater, Mich.
A. W. Toppan, Toppan Boat Mfg. Co., Medford, Mass.
Joseph C. W. Van Blerck, Van Blerck Motor Co., Monroe, Mich.

It was finally decided that an inquiry be sent to all members of the Association seeking their views on the question of holding a Show. Following receipt of these replies the Executive Committee will again meet and make its decision, based entirely upon the expressed desires of the members. It having been established that Grand Central Palace will not be available for exhibition purposes until 1920 at least, either Madison Square Garden or some other suitable building will have to be secured if the Show is to be held. Sufficient time must also be given to the trade in which to prepare a proper exhibit as, for instance, it would be impossible for any of our boat builders to complete a sizeable yacht for purposes of exhibition without having at least three months time to properly finish the job. There should be no difficulty, however, in securing a splendid showing of runabouts and other small craft, while, of course, the engine builders and manufacturers of accessories could get ready for a Show in even less time.

There appears to be more than even the usual need for a Show this year. Prospective purchasers of boats, engines and equipment will have much to look at that will be found new and desirable, and some real first-hand educational work is needed in order that the public may be brought to a realization of the conditions affecting present-day price levels. As the Show could not possibly be held much before March or April those exhibitors who have long maintained that a Show held later in the year than the dates that have usually been selected in the past will have an opportunity to ascertain for themselves just how much better a springtime Show might prove to be. Then again, the whole country and New York City in particular is laying plans for a strenuous session of preparation for big new business that is even now starting to develop in all lines.

New York will have its Automobile Show in February, Aeroplane Show in March and other trade exhibitions throughout the balance of the winter and spring. New York City itself will continue to be in a condition considerably beyond its usual seething activity. Dozens of shiploads of returning soldiers, sailors and other world travellers are coming into port every day and the hotel accommodations are at present taxed to overflowing and will continue to remain in that condition indefinitely due to the presence of relatives of the homecoming veterans, as well as buyers and other representatives of big business from all over the country. If, as in all other exhibition enterprises, the claim is maintained that the attendance at these huge Shows is governed by the floating population of the city, it must appear that industrial exhibitions in New York City particularly are due for record-breaking crowds.

To many of our marine manufacturers, it appears that if ever there was a psychological moment in which to strike hard with such real educational advertising as the National Motor Boat Shows afford NOW IS THE TIME. For fourteen years there has been a continuity of these annual exhibitions, each one in turn presenting before the public the best that the industry afforded in the way of boats, engines and equipment. Advances in design have been shown, new ideas presented and the Show each year has marked a step forward by our manufacturers in the education of the buying public. Now that the war has ceased, the peculiar conditions imposed upon us by war-time conditions are gradually being swept away, and in a short time all of these authorized business restrictions will have been eliminated.

The present situation of the steel market, the new era of reconstruction with its problem of labor distribution and other factors, were thoroughly discussed at this meeting of the Executive Committee, and it was the general opinion of those present that, while re-adjustment to these new conditions might take some little time, the builders would all soon be in a position to care for the big new business that is being forecast by every one.

The Committee also went on record as approving of the suggestion that steps be taken by the Association to give every possible aid to the Government's organized bureaus in obtaining employment for discharged men of the service. Through the offices of the Association, investigation of the applicant's references and ability can be made, and from information at hand as to vacancies in our members' plants many of these men can no doubt be placed to advantage.

Following the meeting, a dinner was tendered to Mr. John J. Amory who retired from the Presidency of the National Association after having served in that capacity throughout the fourteen years that have elapsed since the organization of the national body in 1904. During the dinner, Mr. Amory was presented with a beautiful silver table set by his associates on the Executive Committee. The presentation speech was made by President Henry R. Sutphen who, in concluding his laudatory remarks, aptly stated that the gift to Mr. Amory was in grateful remembrance of his untiring devotion to the affairs of the National Association throughout his many long years in office.

The next meeting of the Executive Committee will probably be held not later than January 10th.

MATTHEWS CRAFT

ASK ANY OWNER

"Quality Without Extravagance"

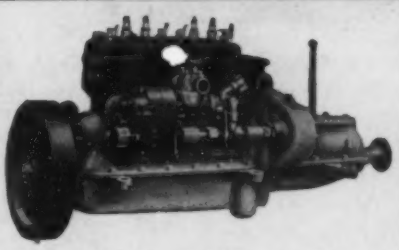
The Matthews Boat Co.

Marine Railways
Storage Basin and
Works

Port Clinton, Ohio

GRAY

4-Cycle
10 to 24 H. P. two and four cylinder



Made good in every case. Speed-boat, Work-boat, Cruiser and House-boat.

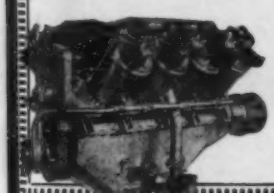
Designed strictly for *marine* work—a real *marine* motor with all the marine features you have always wanted at a *moderate* price. Manufactured and backed up by an old established and responsible concern.

GRAY TWO-CYCLES—Recognized all over the world as a standard. In sizes 3 to 8 H. P. Send for big INSTRUCTIVE Catalog.

GRAY MOTOR CO. 2112 Mack Ave. DETROIT, MICH.

AEROPLANE MOTORS FOR SALE

We have eight Aeroplane Motors for Sale. These motors were especially built for aeroplane service, but due to changes in design are not suitable for present use. Will make wonderful speed boat motors.



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Curtiss Aeroplane and Motor Corporation

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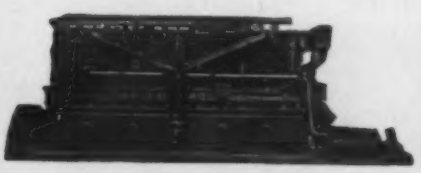

6-Cylinder, 6½" x 8½" 65 H.P.
Twentieth Century Engine

N. Y. Yacht Launch .... AND .... Engine Co.

Morris Heights
NEW YORK

Make That Leaky Boat Leak Proof Now

with

JEFFERY'S MARINE GLUE

THE OLD RELIABLE IS THE BEST ON THE MARKET

For Deck and Hull Seams of Yachts and Motor Boats
—USE—
No. 1, Extra Quality

For Waterproofing Canvas for Covering Decks, Tops of Cabins, Canvas Boats, Canoes and Flying Boats
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Waterproof Liquid Glue is used for the same purposes as No. 7, Soft Quality

This glue will also attach canvas, cork, felt, rubber, leather, and linoleum to iron, steel, or wood.

Special Marine Canoe Glue
Best Filler for Canvas
Black, White and Yellow

It is a Johnnie-on-the-spot article that no boatman should be without.

For Ships' Decks Use: No. 2, First Quality Ship Glue. No. 3, Special Navy Glue. All put up in 1, 2, 3, and 5-lb. cans; also 14, 28, 56 and 112-lb. boxes, either tin or wood

Insist On Having The Right Kind If You Hope To Obtain Satisfactory Results

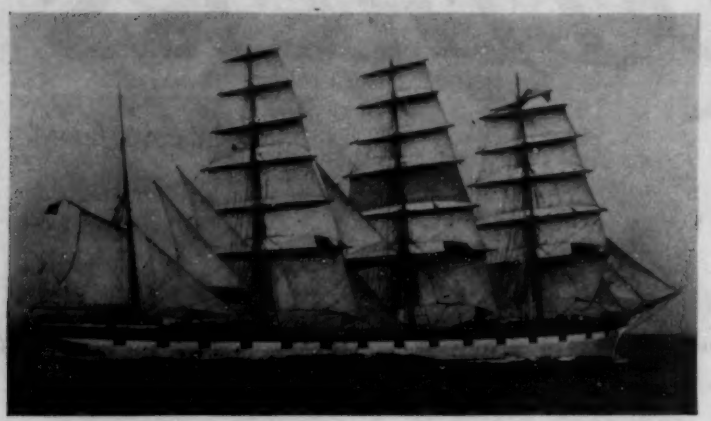
The largest dealer in town carries this in stock; if not he should. Tell him to write us for the agency.

AGENTS WANTED EVERYWHERE. For sale by all Yacht, Boat and Canoe Supply Houses, Hardware and Sporting Goods Dealers. Send for booklets—"Marine Glue, What to Use and How to Use It." "How to Make Your Boat Leakproof." "Seaplane Float Construction."

L. W. FERDINAND & COMPANY, 152 KNEELAND ST., BOSTON, MASS., U. S. A.

When Old Ocean Labors

JOHN ARTHUR BARRY



TALES of the sea are incomplete without a sailing vessel for their stage, and without a Bucko mate. The chow must be rotten and scarce, and the crew half large enough to work the ship. Given these conditions and a good story is assured.

WELL, Harry, no more treasure-hunting trips, I suppose," remarked my mate, Phil Scott, as we sat, and smoked, and watched the big, grey warships in Farm Cove, Sydney Harbour, one fine, hot, November day.

"Not if I know it," I replied emphatically, thinking of a recent unpleasant experience in the South Pacific.

"Fossicking of the sort we take up with in deep water is far too lively a business for my fancy. What do you say to something quieter—a big sailer-tramp, for instance?"

"Right you are!" said Phil, "and the bigger the better. Let's go Home, and have a look at the Tower, and Westminster Abbey, and Saint Paul's, and those other places we hear the English Johnnies talk about. I think it's up to us, anyhow, to see what the Old Country's like. Besides, our spare cash is getting mighty short once more."

"Yes," I replied, "it's certainly time we were outward bound again. And it will be before the mast. No billets going a-begging now, aft of it. I was talking to one of the men on the *Iron Earl* yesterday, and he said he thought that a couple of hands were wanted. Let's go round and call on the skipper."

But we waited a little longer. One of the cruisers was getting under way; sixty fathoms of paying-off pennant curved from her masthead down to a gilded bladder bobbing on the water; her band played "Home Sweet Home"; the sound of cheering from her consorts came faintly to our ears.

She was going to England to be paid off and re-commissioned.

"Good-bye, old girl," said Phil, waving his hand to the departing ship. "We'll be a long way behind you; but we'll get there all the same."

We found the *Iron Earl* lying at the Central Wharf. She was a big two thousand ton sailer, nearly ready for sea, and down to her Plimsoll mark with copper ore, pig lead, tallow, hides, and wool. To us, accustomed of late to comparatively small craft, she appeared simply enormous, with her broad, clear spaces of deck, towering spars, and square yards. One would have imagined that it required at least thirty men to work her. Actually, her full complement proved to be fourteen, exclusive of six apprentices; and ten of the fourteen were ordinary seamen. These were on board at present, and the captain said he wanted four A. B.'s. He could, he remarked, manage with three at a pinch, but would prefer the extra hand if he could get him.

This master mariner was a tall, dark man, civil-spoken enough, and with a decisive, alert look in his eye, contradicting a rather slow and hesitating manner and a shuffling carriage.

"Yes," he said doubtfully, as he glanced at our discharges, "these are all right enough: but, to tell you the truth, I don't care about Australian sailors in my fo'c'sle. They seem to think the deep sea belongs to them; and they're always growling for duck and green peas; not to mention other little ways that unfit them for big ship work. At least that's my experience of them. Otherwise, I'd sign you on."

"All right, sir," replied Phil, laughing; "sorry to have troubled you. But you know we can't help being natives of this poor old country."

"Hold on," called the skipper, as we turned away, "what do you men want to go deep-water for? Why not try the coast, as you Australians usually do?"

"Well," said Phil, "I don't know that we are so very particular about the matter. Only we wanted a quiet spell after a picnic we've just had; also, we thought we'd like to have a look at the Old Country, and all the fine London sights we've read about."

"Oh, that's it, is it?" said the captain with a smile. "Of an inquiring turn of mind, are you? Economically disposed, too, and want to be paid for the tour in an easy-going limejuicer. Now I suppose neither of you knows anything about blacksmith's work?"

"Well, sir," said Phil, while I wondered what was coming, "I can do a little with a bit of hot iron. I'm not a professional; but if you want a horse shod, or a pick laid and steeled, or any other odd jobs of that sort, why, I'm able for them."

The captain laughed outright as he answered: "Not much in my line—horses and picks; but I dare say you'll do well enough to knock up some bolts, and spikes, and stuff of that sort, or to repair any little breakages we may have.

"All right! I'll make an exception in your case, if you'll promise not to take charge of the ship the first day out; or attempt to engineer a mutiny before we've been a week at sea. The pair of you can come up to the Shipping Office to-morrow."

"Rum go, isn't it, Harry?" remarked Phil, "that a man's ability to do a bit of smithing should get him an able seaman's billet? And, by Jingo," he added, staring around and

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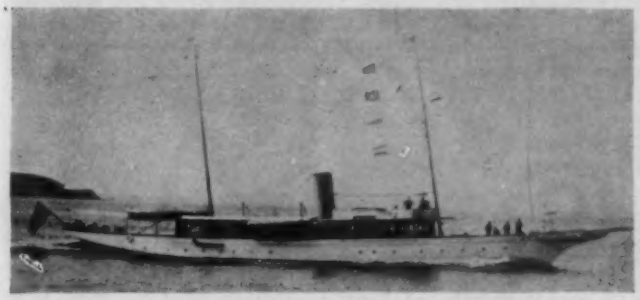

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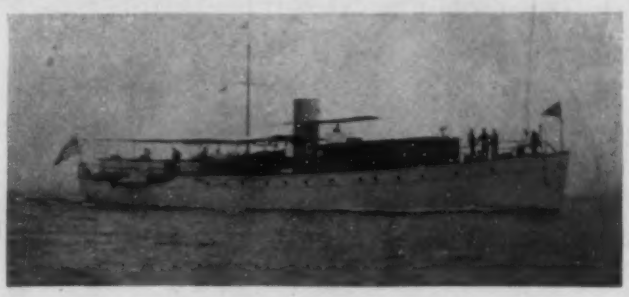

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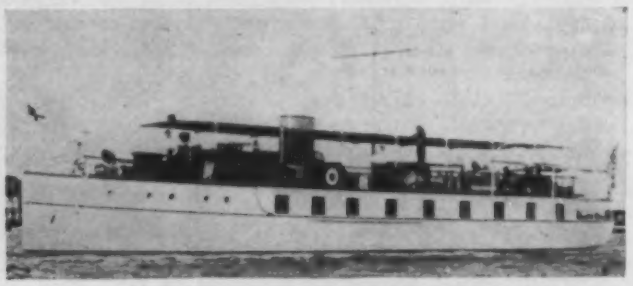

NO. 3617—FOR CHARTER—Desirable 90 foot twin screw Mathis houseboat. Located Florida in commission. Accommodates 3 double, one single stateroom. Besides saloon berths all told 12 persons. New furnishings last year. Outfit in perfect condition. Gielow & Orr, 52 Broadway, N. Y. City.

NO. 3241—FOR SALE—Handsome Lawley built auxiliary keel schooner. 80 foot W. L. 23 foot beam. Steel construction. Standard motor, speed 8 knots. 4 staterooms. Fully found and perfect condition. Gielow & Orr, 52 Broadway, N. Y. City.

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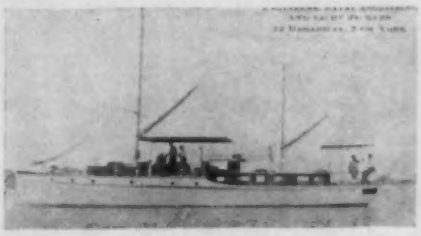
NO. 5455—FOR SALE—48 foot shoal draft bridge deck cruiser. 14 foot beam. Exceptional accommodations below and on deck. 40 H. P. Heavy duty motor. Equipment complete, all perfect condition. Gielow & Orr, 52 Broadway, N. Y. City.



NO. 4606—FOR SALE—64' sea going cruiser. One double, one single stateroom. Heavy construction. Completely equipped, including launch tender. Gielow & Orr, 52 Broadway, N. Y. City.

NO. 2549—FOR SALE—Attractive keel cruising sloop. 50 foot deck, 30 feet W. L. 11 foot beam. Built by Lawley. Fully equipped, perfect condition. Inspectable Boston. Gielow & Orr, 52 Broadway, N. Y. City.

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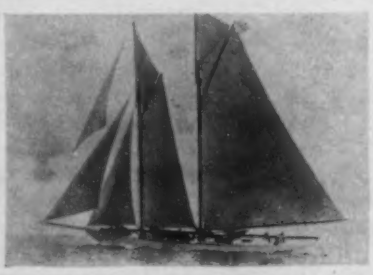

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NO. 4923—FOR SALE—45' Elco cruiser. 11 foot beam. Accommodates 6 persons. Standard motor. Completely equipped, perfect condition. Inspectable Boston. Gielow & Orr, 52 Broadway, N. Y. City.

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aloft, "she looks as if blacksmiths were more wanted on board her than sailors! Harry Ward, we'll have to take a week's tucker when we start aloft in this hooker. Why, her main-royal truck seems as high as one of those big gum trees in the Nandewar Ranges that a fellow gets a crick in his neck trying to see to the top of."

Some of the ordinary seamen were at work on stages slung over the side, chipping and pounding at her iron plates with hammers and scrapers. And they were all youngsters, mere boys most of them. Inboard were half a dozen apprentices painting, scrubbing, and polishing—little nippers of twelve and fourteen, who looked as if they had been kidnapped from school by a chimney-sweep, and set to learn his business.

"A queer turn-out, Phil," I assented, "and a cheap one. Two pounds a month at the most for the ordinary seamen. Why, with our six pounds, we'll be millionaires among them. And look at the mate. I'll swear he's not a day over two-and-twenty."

"Well," said Phil, "it's one comfort, at any rate, that they all seem to be English. And you mustn't forget that I've got a new rating, Harry. I'm a 'seaman-blacksmith.' How does it sound? She carries a carpenter, too; I saw him mending one of the gratings—almost the only wooden thing about her decks. I wonder what he finds to do?"

Next day we took our traps on board; and, later, signed Articles for a voyage to London or any other port in the United Kingdom.

Our quarters in the *Iron Earl* proved to be a large deck-house, reaching from the galley at one end of it nearly to the foremast, a light and airy place enough, with eight open bunks along each side, and as many large ports, table and benches down the center, and a few lockers and cupboards at each end. A pair of doors afforded ingress and egress. Everything was scrupulously clean, and, altogether, the place was a vast improvement on the old-fashioned lower or top-gallant forecastles innocent of both light and ventilation.

Two more A. B.'s, we found, had been shipped; one a Dane, quiet, silent, and bovine; the other an old Englishman, a gray, growling relic of the past school of merchant seamen, now almost utterly extinct. As broad nearly as he was long, with a thin band of white whisker frilling his lined, red, weather-beaten face from ear to ear under the chin; sharp, light-blue eyes that peered twinkling under thick, heavy, over-hanging brows; great hands all scarred and seamed and discoloured by years of tar and toil, and fingers knotted and hairy as those of a gorilla, and always held half-open as in the act of clutching; a slow, deliberate, lurching walk; a back curved like a turtle's, and you have old Grills, looking a very Nestor of the salt seas among us, as he sat on a big round-bottomed bag, and glared around him and chewed on his quid, the first time we all met together.

"Haw, haw!" he laughed presently, "so this is the way they man the windjammers nowadays, is it? Why, I might be father to the lot o' ye—which the Lord forbid. Ornery seamen an' a lot o' kids wi' not as much hair on their faces, all put together, as I got on the back o' my hand. An' what a caboose!" he continued, looking round with a snort of disgust. "A shickery, rotten sort o' thing as a good heavy sea'll walk overboard, schooner-rigged, one o' these fine days—leastways if seas ain't changed as much as ships is sence I sailed over 'em."

"And where have you been putting in the time of late years, then, if it's a fair question?" asked Phil very politely.

The old man turned and regarded him attentively, as one might do a species of new and extremely curious animal. Although tall, my mate was a well-built, wiry fellow, deep-chested, narrow-flanked; and, spite of lack of beard or moustache, he possessed a strong, determined face, whose frank expression was enhanced by a pair of well-opened brown eyes.

"Umph," grunted old Grills at last, "and who might you be that's so darned inquisitorius—one o' the cook's mates, I shouldn't wonder?"

"No," replied Phil gravely, "I'm rated as a first-class seaman-blacksmith on this ship; and I shall always be glad to do any little job in my line for you."

"A blacksmith!" exclaimed the old chap. "Oh, good Lord! ain't there a tinker, or a paper-'anger, among ye into the bargain?"

"Not this trip, I'm afraid," replied Phil, "although I believe the very big sailers carry them, as also barbers and wire-ropemakers. Now, I'll bet anything you've been stowed away in the Bush these last few years, and have forgotten most of everything you knew about ships, and sailor's work. Do you think, now, you could remember how to turn in a bit of rigging, and tell us which is generally reckoned the best fashion—end-up, or cutter-stay, or dead-eye spliced in?"

The other smiled sourly as he replied: "Never was up the Bush in my life, so you're out of it. An' as for sailorisin', I've forgot more'n you ever larned, Mister Blacksmith—which, o' course, is gammon. An' when it comes to settin' up our riggin', mebbe I'll teach you a wrinkle or two about such matters as dead-eyes, an' turnin'-in lanyards.

"You won't get the chance, I'm afraid," said Phil; "you see we do it all with a turn of the screw here."

And intense was the old man's astonishment when, later on, he actually saw Phil at work with the portable forge making a lever for these same rigging-screws.

But the *Iron Earl* held many more surprises for the old-time sailor, from the donkey-engine that so rapidly hove the anchor up from the bottom of Neutral Bay, where we had lain for the night, to the steel lower and topmasts all in one, and the numerous patents rigged here and there about the decks.

After a while, we discovered that for many years Grills had been employed as night-watchman at a meat-freezing establishment in one of the outlying Sydney suburbs. Then, all at once, seized with a sudden desire to return to the old life, he had made interest with his firm to procure him a berth which, at his age and unaided, he would probably have otherwise found impossible. As large shippers, they were enabled to do this, although Captain Disney rather objected to the arrangement. He need, however, have had no fears; for the old man proved in a very short time as fit for work as many of the young ones, while his perpetual grumbling as he vented his ire against some "new-fangled fad" was a source of never-failing amusement to all hands.

The tables, and benches, and knives and forks, and more especially the plates, with which the fo-c-sle was furnished, were a standing grievance to him.

"In my time," he would say, "a biscuit and a sheath-knife were reckoned good enough to eat your meat with; plates for the pea soup, o' course, we had—as was only reasonable—but they was honest tin uns, an' not these henamelled rubbitch what looks so tony wi' a piece o' grannit junk or stinkin' pork on 'em."

And, truth to say, the "tucker" on the *Iron Earl* was very far from good. Nevertheless, the young ordinary seamen who had been in her since she left Liverpool never complained; nay, they even seemed to thrive and grow fat on the terrible "salt-horse," "high" pig, and coarse adamantine "bread" served out to us. Even old Grills munched away methodically without any more than a sly remark to the effect that our table reminded him of a time when "sailors was sailors, an' not blacksmiths an' 'ousemaids"; and that if ships themselves had changed, certainly their provisions were much of

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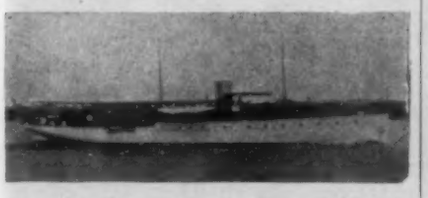
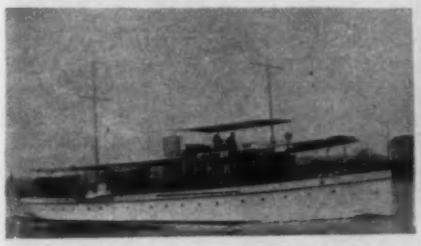
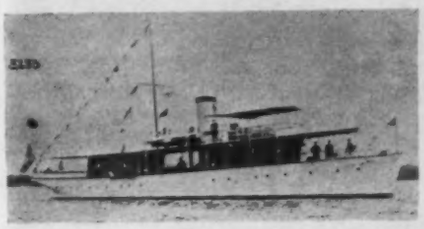


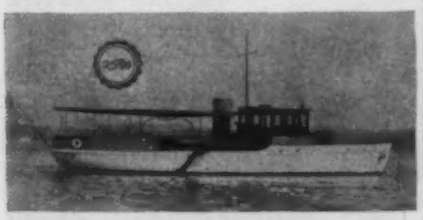
NO. 2030—FOR SALE OR CHARTER—Modern, very roomy, twin screw power yacht, 124 x 18.6 x 6 ft. (Now has after deckhouse). Very economical to operate. Large dining saloon and social hall on deck; main saloon, six staterooms, two bathrooms and three toilets aft. Handsomely finished and furnished. Cox & Stevens, 15 William Street, New York.



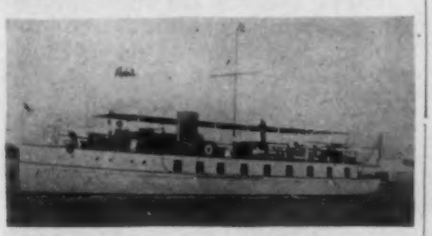
NO. 1796—FOR SALE OR CHARTER—Very roomy, light draft, twin screw cruising power yacht, 90 x 17 x 4 ft., adapted for Florida service. Speed 12–14 miles; Standard motors. Large dining saloon, six staterooms, three bathrooms; all conveniences. Cox & Stevens, 15 William Street, New York.



NO. 3233—FOR SALE—Particularly desirable 123 ft. steel steam yacht. Speed up to 17 miles. Recent build. Dining saloon and social hall on deck; five staterooms, two bathrooms, etc. Best craft of type and size available. Cox & Stevens, 15 William St., New York.



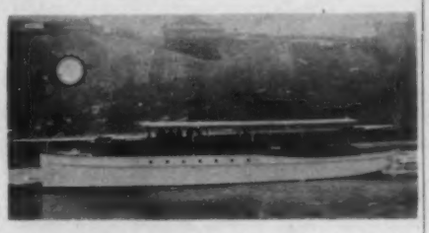
NO. 2580—FOR SALE—Light draft, Lawley built, 68 ft. twin screw power yacht. Speed 11-13 miles. Enclosed deck house with dining saloon below forward; two double staterooms aft. Practically in commission. Cox & Stevens, 15 William Street, New York.



NO. 1662—FOR SALE OR CHARTER—Attractive 90 ft. twin screw gasoline houseboat; speed 10–12 miles. Large saloon, four staterooms, two bathrooms; all conveniences. Handsomely furnished. Cox & Stevens, 15 William Street, New York.

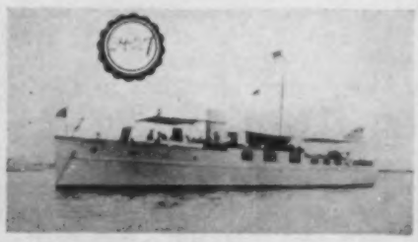
NO. 3035a—FOR SALE—Fast and very roomy bridge deck cruiser; 47 x 10 x 3 ft. Speed 16 miles; 100 H. P. 6 cyl. 4 cycle motor. Separate galley, saloon and single stateroom forward, besides double stateroom and toilet room aft. Electric lights. First class condition. Cox & Stevens, 15 William Street, New York.

NO. 3241—FOR SALE—Light draft, roomy bridge deck cruiser; 48 x 14 x 3 ft. Speed 10 miles; 6 cyl. 4 cycle motor. Built 1915. Double stateroom, saloon, two toilet rooms, etc. Cox & Stevens, 15 William Street, New York.

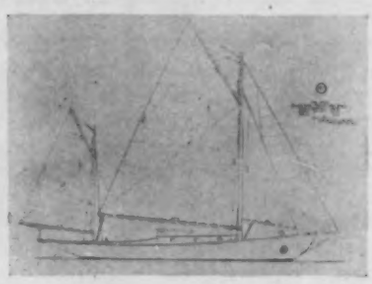


NO. 3169—FOR SALE—(In Florida waters)—Very roomy, light draft twin screw power yacht; 84 x 16.6 x 3.6 ft. Large deck space. Speed 12–14 miles. Dining and main saloons, three staterooms, three toilet rooms; hot water heating plant, electric lights, etc. Cox & Stevens, 15 William Street, New York.

NO. 2560—FOR SALE—Fast, V-bottom, twin screw power cruiser; 60 x 13 x 3 ft. Built 1917. Speed up to 18 miles; two 6 cyl. Sterling motors. Double stateroom forward; roomy saloon aft with separate galley; two toilet rooms (one with Sitz bath). Low price for quick sale. Cox & Stevens, 15 William Street, New York.



NO. 3427—FOR SALE AT LOW FIGURE—Fast, roomy, twin screw cruising power yacht: 74 x 14 x 3.9 ft. New 1916; Lawley built. Speed up to 16 miles; two 6 cyl. "Speedway" motors 110–120 H. P. each. Large saloon, three staterooms, shower bath, etc. Cox & Stevens, 15 William Street, New York.



NO. 3211—BARGAIN—Up-to-date, centerboard auxiliary yawl; 40 x 32 x 10 x 3.8 ft. Built 1913 from our designs. Cabin trunk and deck trim of teak. Two berths in cabin, toilet room, etc. Speed under power 9 miles; 25–40 H. P. Sterling motor (new 1915). Excellent opportunity. Cox & Stevens 15 William St., New York.

NO. 3541—FOR SALE OR CHARTER—Particularly desirable 100 ft. steel twin screw cruising power yacht. Practically in commission; very attractively finished and furnished. Speed up to 15 miles; two 6 cyl. air-starting and reversible Standard motors. Fitted with every convenience. Large dining saloon and social hall on deck; five staterooms, bath, two toilet rooms, etc. Without doubt finest craft of type and size available. Cox & Stevens, 15 William Street, New York.

NO. 148—FOR SALE—Steel, flush deck, steam auxiliary schooner yacht; 130 ft. overall, 110 ft. waterline, 26 ft. beam, 15.6 ft. draft. Speed under power 9 knots; compound engine; electric lights; all conveniences. Extremely able craft; heavily constructed. Cox & Stevens, 15 William Street, New York.

NO. 3561—OFFERED BY ESTATE—Lawley-built, flush deck, keel auxiliary schooner yacht, 90 ft. overall. Recent build. Saloon, three staterooms, bathroom, etc. Ratsey sails. Speed under power 6 to 7 miles. Exceptional opportunity. Cox & Stevens, 15 William St., New York.

the same quality. And he actually seemed to feel a pleasure in the fact.

But quite unaccustomed to such fare, Phil and I would have strongly protested, but for that remark of the skipper's about the manners of Australian seamen.

So we held our peace, and subsisted principally upon biscuits and black sugar—so long as the solitary pound per week of the allowance lasted. It was tantalising, though, to see the style in which the English lads made away with rancid slices of pork washed down with vinegar; smashed biscuits up with iron belaying pins, mixed them with salt fat from the cook's slush tub, and then baked and ate a mess sufficient to turn the stomach of a dog on any intercolonial traders. Old Grills, too, seemed to flourish on the food, notwithstanding that for a very long period he must have lived well ashore. He swamped his pork with molasses, of which we were allowed several ounces once a week; and he ate his pea soup thickened with sugar, declaring that such was the only fit and proper fashion.

Anyhow, it all seemed to agree with him wondrously, for he became rejuvenated and sprightly as time passed. Some of the men used to place their pannikinful of sugar in their chests, others stowed it away in a pickle bottle under their pillows, or at the foot of their bunks, keeping the while a wary eye on the precious hoard; for a saint without vegetables will steal sugar.

Of limejuice and vinegar there was, however, a practically unlimited supply in the *Iron Earl*. And Phil and I got thinner and thinner, while swearing that not for all the combined glories of the Old Country would we ever be induced to sign on in one of her ships again.

On a Saturday we filled ourselves out with boiled rice, or, rather, with the brown, husky stuff that passed for it; and on Sundays we laid the foundation of future internal misery by means of a "duff" composed solely of flour, water, and fat, boiled to the consistency of something very like lead. In these circumstances perhaps "henamelled plates" might well be considered a delusion and a snare.

Nor did the apprentices—who lived with the carpenter, the sailmaker, and the third mate, in a little house further aft—appear to fare much better, except for what they stole from galley and pantry. And, altogether, I was quite satisfied that the stories heard on the coast of how the British sailor was fed on the majority of his own sailing ships, and which I had always regarded as overdrawn, were, on the contrary, quite true.

CHAPTER II

With our small, light-weight crew, it seemed to us, as well as to old Grills, that in the first blow there must inevitably be trouble. We caught it just after rounding New Zealand on our way to the Horn. Tumbling out to the cry of "All hands shorten sail!" we found that the watch had already got the light stuff in, and that now the upper topgallantsails and upper-topsails and mainsail were to come off her. It was the first time we had handled her canvas in any wholesale fashion, and some of the "wrinkles" employed as a set-off to the scarcity of men were rather surprising.

Thus, what with clewing-up to the yard-arm in place of to the bunt, and the use of a multiplicity of buntlines, spilling and leachlines—on the mainsail alone there were fifteen—by the time we got aloft the sail was so bound around and enveloped in ropes as to render it comparatively easy to stow without the tremendous exertion once necessary in hauling and tearing at a great weight of canvas, mostly centred in one portion of the yard, and blown stiff and rigid by the holding in its bosom of a small gale of wind.

Aforetime, it used to take many men to drag the bunt of a course on to the yard, a job performed to the sound of a rude chorus of "Hey, hey, hey, yah! we'll pay Johnny Doyle for his boots!" ending in a loud roar with the last word, and a combined tug at the bulk of often sodden canvas, moving the mass perhaps a few inches at a time. This process was repeated again and again, with much expenditure of breath and energy, until the sail was made fast.

Of course, Phil and I were well aware of the modern methods in use. But Grills was not; and stationing himself in the slings of the yard he stood up and prepared his lungs for action, nearly falling over with surprise as the slim roll of canvas met his grasp, while two children-apprentices passed a gasket and secured it, impatiently shrieking at the old man to "shift himself."

The *Iron Earl*, as we had soon discovered, was a wet ship. And, now, in fairly heavy weather her decks from for'ard right aft to the little poop—"Monkey Island," as we called it—were up to one's knees in a great wide sweep of white water, over hatches and all else except the capstan on the quarterdeck that some wag called "The Eddystone."

Our doors were barricaded by wash-boards nearly breast-high, which took considerable practice to climb over in oilskins and sea-boots. Luckily, the numerous bulls'-eyes gave plenty of light in the house, and one could see comfortably to read print in the half-hour before turning over to sleep.

Various ancient magazines, alleged sea novels with the technical errors underlined and very emphatically commented upon, sporting romances, illustrated newspapers, books on navigation, theology, and travel, all found their place in our library—the one spare lower thwartship bunk, packed high with the accumulation of many voyages. Everybody except old Grills and the Dane read omnivorously. The former mounting a pair of silver-rimmed specs would generally sit on a chest and pretend to mend his clothes or his boots before turning in. Not because they required mending, for he had a capital outfit, but because he had done the same thing thirty years ago in his watch below. And he would talk in a low, rumbling tone to the stolid Dane, busy with his knife at shaping a half-model of the *Earl*, quite content to receive an answering grunt now and again.

Around, in upper and lower bunks, the rest of the watch lay silently reading and smoking; one of them perhaps desisting now and again to listen and chuckle at something like this:

"Aye, Carl, my boy, you b'lieve me, these 'ere half-tide, rotten iron tanks wi' their tawps'ls and t'gants'ls split in two halves, an' paten' this an' paten' that, ain't a patch on the ole frigate-built ships I went to sea in fust. Forty an' fifty men afore the stick they carried, my boy; an' the watch could snug 'em down to a close reef. When it was 'All hands!' in them craft there was somethin' the matter more than a bit of a squall. An' the men was sailormen in them days; not a passel of egg-faced boys as don't know enough among 'em to reeve a double purchase, or even set up a backstay in shipshape fashion. They wastes their time now in readin' rubbitch, instid o' larnin' their duty. Able seamen they'll never make; able loblolly-boys and bottlewashers, more like! Aye, aye, I mind when I was quartermaster o' old Dicky Green's *Highflyer*——" and so on, and so forth.

And all the time the big iron lump plunged her ugly beak into the combers, and scooping up as much water as she could, sent it roaring past the doors to where the watch on deck were collected on the afterhatch under the skidded boats, trying to shelter themselves from the spray that whipped in volleys over the deep ship, and rattled across the roof of the house in which we lay snug and warm among the blankets, until a dreaded voice shouted in accents of

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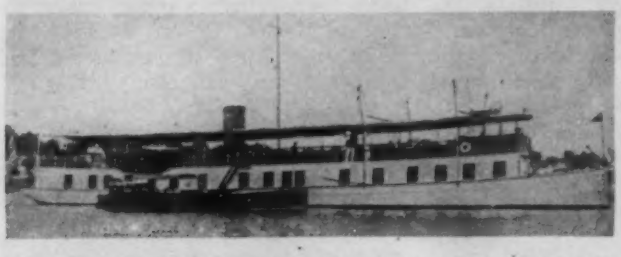

NO. 1848—SALE—CHARTER—Modern houseboat, ideally suited for southern waters, 123 x 115 x 17.8 x 3.4 ft.; 2 Standard motors, 4 large staterooms, 2 bathrooms, saloon; very large shade deck; lighted by electricity and has new ice machine. Full particulars from Tams, Lemoine & Crane, 52 Pine St., New York.

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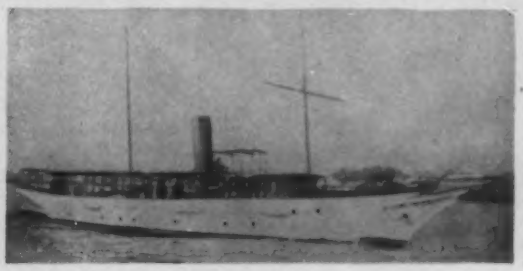
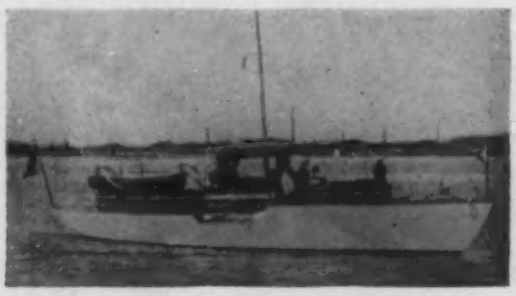


NO. 7987—FOR SALE OR CHARTER—Modern cruising motor yacht 106 x 13.6 x 6 ft. draught. Built 1911. 300 H. P. Standard motor; speed 13 knots; 4 staterooms, saloon below, deck dining saloon, bath room, 2 owner's water closets. Lighted by electricity. Large quarter and bridge decks. Full data from Tams, Lemoine & Crane, 52 Pine St., New York.



NO. 8940—FOR SALE—Exceptional opportunity to purchase at a bargain, raised deck cruiser, 61 x 12.10 x 3.6 ft. draught, built 1909, 2-40 H. P. Knox motors new 1912, lighted by electricity. Excellent owner's accommodations. Further particulars from Tams, Lemoine & Crane, 52 Pine St., New York.

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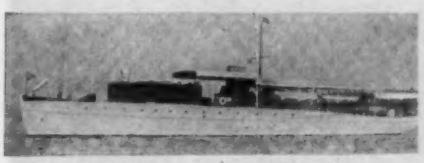
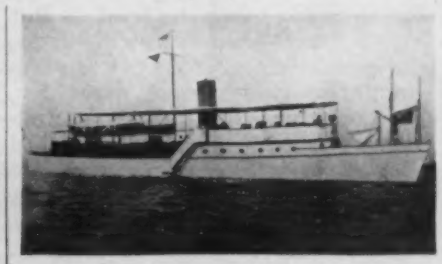
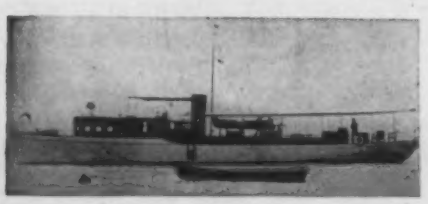


NO. 1937—Diesel Power Yacht, 110 ft. by 18, two 6 cylinder 150-180 H. P. engines; low fuel cost. Apply William Gardner & Co., 1 Broadway, New York.

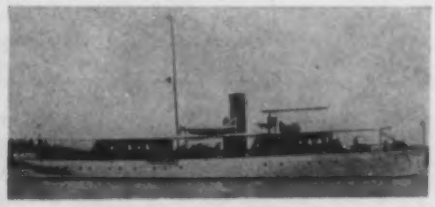


NO. 924—Power Yacht, 92 ft., six-cylinder 20th Century motor recently overhauled, good deck space. Apply William Gardner & Co., 1 Broadway, New York.

NO. 2343—Practically new, twin-screw 60 foot express cruiser, Sterling engines, speed 22 miles. Apply William Gardner & Co., 1 Broadway, New York.



NO. 1081—FOR SALE—Twin screw 90 ft. power yacht, splendid accommodation. Recently overhauled and two new Standard 4 cylinder 75 H. P. each, installed 1916. Exceptionally able and fully found. Apply William Gardner & Co., 1 Broadway, New York.



NO. 646 — SALE — CHARTER — Steel Steam Yacht, 123 x 17, two large deckhouses, five staterooms, etc. Condition good as new. Apply William Gardner & Co., 1 Broadway, New York.

joyful anticipation through the barely opened door: "Now then, you sleepers! Eight bells! Time to show a leg on deck!"

And if the herald of discomfort could add that it was raining or sleeting, or that the weather was "worse than ever," so much extra satisfaction came into his cry that he generally got sworn at or warned away with a sea-boot.

But he bears no malice; and, presently reappearing, throws in a heap of partly dried clothes that, by the cook's goodwill, have been steaming in the galley. There are grumbles, and shivers, and grunts, as the things are drawn and dragged over warm flesh; legs and feet shoved into damp stockings and trousers and spongy sea-boots; and, over all, wet and clammy oilskins fastened at waists and wrists by lengths of spunyarn known as "soul-and-body-lashings."

"Whose wheel is it?" asks someone suddenly, his toilet only half completed.

"Why, Bill's," replies another. "I had the two to four. No, by Jingo, it's your own, you flathead! It'll be a ten minutes' relief all right; an' Tom'll serve you out proper next time."

And the forgetful one after scurrying around frantically, a stocking short, unable to find his mitts, or cursing a mislaid sou'-wester, at last climbs over the wash-board into three feet of icy water, and goes splashing aft to stand his two hours' trick, lucky, indeed, if he escapes a thorough ducking before he gets to the poop ladder.

We are all of us late, and the watch on deck, coming in as we go out, jeer as they peel off their saturated garments and satirically entreat us not to hurry on their account.

"Ugh," grunts one, as we finally struggle aft just in time to meet a more than ordinarily heavy sea that gurgles and eddies and froths level with our knees, "who wouldn't sell a farm an' go to sea!" followed by another with, "The man who'd go to sea for pleasure'd go to h—l for pastime."

"Soft, soft as putty, the lot o' ye," growls old Grills. "Why, when I was your ages I was 'ard as nails, an' took notice o' nothin'. An' dash my ole buttons, if I don't b'lieve I could stand more than most o' ye now."

Indescribably dreary is the scene, as the ship with her white masts and yards, naked, now, but for six dark patches of topsails, and spreading breadth of foresail wet to the reef-band with flying spray, pitches heavily, almost, it seems, burying her fore-staysail into a leaden sea running high under a leaden sky that her reeling royal-masts appear at times almost to sweep.

Aft, the mate paces "Monkey Island," his long oilskin coat flapping in the gale, while to leeward cower three muffled bundles of small apprentices, hands and faces blue with the keen, biting wind, as one or the other of them, even thus early in the watch, sneaks a glance at the clock through the companion-hood to see how the time is going.

To and fro, backward and forward, rushes the water, swish, swash, foam-foam, gurgle-gurgle, at the choking scuppers and clanging ports. Roll and pitch, pitch and roll, stiff as a stone wall, wallows the *Iron Earl*, four feet deeper than she ought to be, in spite of the "Plimsoll." And when, by any chance, she misses scooping it in forward, she makes amends by taking it in amidships until she is full up to her pinrail.

On the after-hatch, which is partially protected by the apprentices' house, stand the watch, already pretty well soaked, smoking, chewing, gazing reflectively at the seething water, and exchanging at intervals opinions as to the varying degrees of iniquity possessed by the *Iron Earl*.

To Phil and me it was all quite new, if not interesting. She was our first "wet ship," and as day by day went on bringing the same heavy south-east weather, we swore that she should be the last of her species, so far as we were concerned. The original hands, even the children-apprentices, apparently took a curious kind of perverted pride in her likeness to a half-tide rock, and were accustomed to remark, with an air, that, "it was nothing to what she could do when she tried." But we were more than satisfied with the display already afforded of her abilities. Our clothes were never dry, our boots turned to sponges, our oilskins reverted to their natural hue of grey calico. The decks grew so slimy and slippery that to tread their steep and unstable inclines was like walking on smooth ice. One day, while at the wheel, a thick shower of spray poured down the back of old Grills', neck, and then even that ancient sea-warrior had lost his temper, and all ingrained respect for the place, and to the huge delight of the sea-children, he called the *Iron Earl* by various names of contumely and despite, placing an unexpected vocabulary of lurid adjectives with the greatest care and attention, while drawing the most offensive parallels between the *Earl* and the old-time ships; and winding up by declaring that a vessel that wet her helmsman was only fit to serve as a ferry-boat for the devil.

It was amusing to watch the cook with the saloon tucker, during this weather, on his trip from the galley aft. First a wild rush to windward then a hang on for life to a belaying-pin or a rope, up to his knees in water, then a traverse to the main fife-rail, dish or basin hugged tightly to his breast; then a straight dash for the cabin door where the steward would meet him—if the passage had proved an uncommonly lucky one.

But not seldom the "doctor" would go scooting away into the scuppers, while the watch, always on the qui vive for these excursions, pounced on the provisions almost as soon as they left his hands, and devoured them before he could clear the water out of his eyes. And, once, seeing a great comber about to break its crest over him, he thrust a pie he was carrying into, of all places in the world, the apprentices' house, crying to them to keep it dry for him. The sea broke, and away went the cook, holding on to the bight of a rope, returning presently to be handed an empty dish and be told by shrill voices to "do it again as soon as you can."

But the captain only laughed when complaints were made; and had some tinned stuff heated at the saloon stove for himself and the mates. Indeed, they all lived poorly enough aft, although, of course, like kings compared with the crew. Nevertheless, a backblocks Australian settler of the smallest kind would have turned up his nose at the cabin table on board the *Iron Earl*.

No weather, however, can last for ever; and when the wind, after a long spell of blowing from the way we wished to go, finally shifted and moderated, and we set our "kites," and scraped the green, lichen-like stuff from the decks, and dried our clothes, we soon forgot our trouble as we rolled round "the Corner" and into warmer weather, catching the S.E. Trades early and light.

And, certainly, if we were not overfed, neither were we overworked on this old tramp of a "limejuicer"—as the Americans call the British sailer. For the most part, the watch would be scrubbing paintwork, or making chafing gear, or spun-yarn. Aloft there was little to do, all the running-gear being new, and the standing rigging of steel wire. Phil got out his forge and made bolts, and hatch-bars, and collars, and such like truck, while I struck for him; old Grills helped the sailmaker, and spun him long yarns about ancient ships and the superior race that manned them; and the carpenter pottered about some fancy gratings for the wheel.

The mate was a quiet lad who interfered with nobody, so long as

(Continued on page 44)

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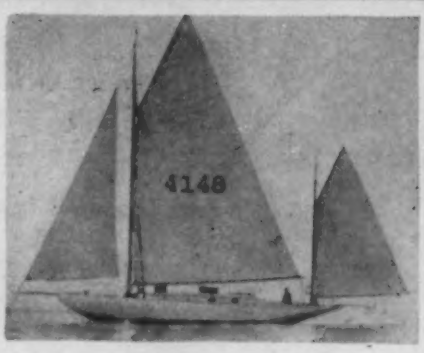
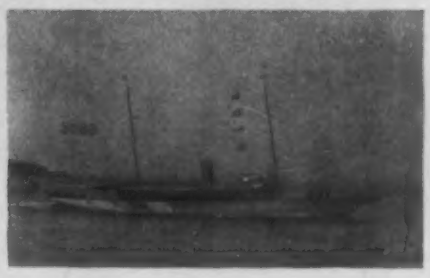


NO. 4148. Auxiliary keel yawl 46' x 32' x 13' x 6'. Double stateroom and saloon sleep five. 15 H. P. Sterling Motor. Speed, 7 miles. Splendid proposition. Apply H. H. Jennings Company, 1 Broadway, N. Y. C.



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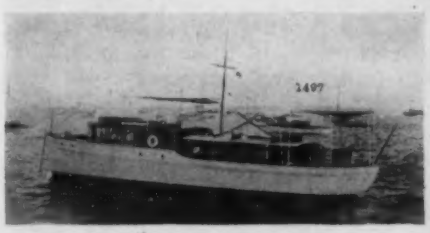
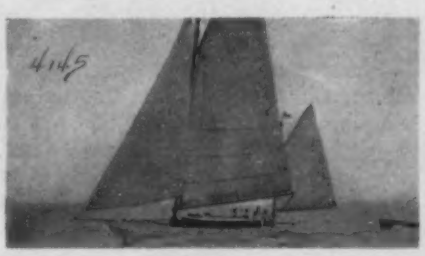


NO. 1497. 51 foot cruiser. Two double staterooms. Dining saloon in sunken deckhouse forward. Galley, toilet room, also berth and toilet for man. 40 H. P. Murray & Tregurtha Motor. Electric lights, etc. Speed 11 miles. Splendid proposition. Apply H. H. Jennings Company, 1 Broadway, N. Y.



NO. 4145. 40 foot auxiliary centerboard yawl. Sleeps four people. 6 H. P. motor. Electric lights, etc. Good condition. Price attractive. Apply H. H. Jennings Company, 1 Broadway, New York City, N. Y.

NO. 1869. 42 foot cruiser. Built 1913. Double stateroom and two berths in main cabin. Berth in engine room. 24-30 H. P. 20th Century Motor. Speed 10-12 miles. Electric lights, etc. Apply H. H. Jennings Company, 1 Broadway, New York City, N. Y.

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Since the return of these Engineers the Splitdorf Company has been doing some hard work in its Engineering Department and has produced a standardized magneto which has been in service for nearly a year in this country with most gratifying results, while France, Italy and England pronounced it to be the best magneto they have ever seen or tested.

One of the most unique features of this airplane type is the standardized c. ne various models. The United States has in use more than 5000 eight-cylinder magnetos of this new type. The Splitdorf Company point out that with sixteen additional parts the same magneto can be converted into any one of seven models, suitable for any existing type of airplane motor which is being extensively used, including the Liberty 8 and 12-cylinder motors with 45° angle between the cylinders.

The following combinations of parts show how these models are constructed from the Dixie 800 Standardized Magneto for 8-cylinder engines as the master unit:—

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Dixie 845 for 8-cylinder 45° V engines—Distributor Block, Distributor Brush, Gears, Cam.

Dixie 1600 for 16-cylinder engines—Distributor Block, Distributor Brush, Gears, Cam, Rotor, Field Structure.

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The above accomplishment is *one* which no other ignition manufacturer in the world can claim, and indicates how thoroughly the Splitdorf Company has studied the problem.

The United States Government has adopted it as the standard aeroplane magneto and since the taking over of the Bosch plant in Springfield, Mass., are manufacturing it there as a second source of supply. This indicates the Government's recognition of the Dixie Magneto as the ignition system for airplane engines, and while the Splitdorf Company cannot manufacture it in sufficient quantities to meet the large demands for it, they have certainly shown their patriotism by offering to the Government its complete specifications for the making of it, wherever the manufacturing equipment is available. As the Bosch Company is tooled up to make the standard 8-cylinder model, and as only 16 parts more will be required to make the other six models, there seems to be no doubt that the Government will avail itself of the Splitdorf Company's generous offer, by adopting it as the standard magneto for all airplane motors.

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DURING the past few weeks the G. W. Ford Yacht Agency, 42nd Street Building, New York, have appraised for owners many pleasure yachts that were loaned to the U. S. Navy for the period of the war.

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Lines and Their Use

(Continued from page 17)

shown in the little picture of an amateur loftsman at work which accompanies this article, this also clearly shows the two plans laid down and some of the loftsman's tools. The edge of the batten that will run concave should always be set on the points laid down as it is easier to draw a line from this edge.

Now for the actual fairing. We will suppose that you have your batten pinned down. Cast your eye along its vertical surface, if this shows a clean easy flowing sweep, the line is fair and may be chalked or pencilled on the floor. If the batten does not show a true and fair line pull out the nails at the point where it is unfair and see if it won't spring out or in and fair itself. Keep this process up altering as few of the spots as possible until it appears fair. When our deck line and profile are finally faired to suit our taste, they may be scratched in the floor also and for further fairing considered unalterable.

Two methods of fairing the body are used. The compound water and buttock line system or the diagonal system.

In the former the two plans are laid down on each other as described before and the lines made fair. There will be points where the water lines and buttocks that are the same distance away from base and centerline cross. These points should be on the same line that is serving the double purpose, see Figure 5. This figure also shows how the intersections of the water lines with the stem are projected down to find their termination on the centerline and the intersections of the buttocks are projected up to determine their endings on the sheer. If all the water lines have been put in and faired and they were projected at every crossing of a buttock in plan view to the line which represents them in profile a series of spots would be obtained that if connected, would form the buttock line in profile. The reverse applies to water lines, that is, if all the buttocks were in and their crossings were projected down to the line which represents them in plan view a line through these series of spots would be the water line as seen in plan view. This is why a buttock and water line cross on the line which represents them both for here there is no projecting up or down for the spot is a fixed point.

When each and every buttock and water line is faired and they cross as described before, a body plan can be laid down. Water lines and buttocks which will appear as straight lines in this plan are laid down true and square and scratched in with a thin batten, one end of which is held on the centerline at every respective frame pick up the half widths of the deck from the plan marking them on the bottom for every frame. To avoid confusion pick up the forward and after frames on different edges of the batten. The batten is now carried to the body plan and with its end resting on the centerline, mark off the half widths on the uppermost waterline. You will notice in Figure 1 how a body plan is generally laid down. The after frames are laid out on the left hand side and the forward frames on the right hand side.

Now pick up the heights of the sheer above the uppermost waterline and after projecting the half width of deck marks up, mark off the height of sheer on them. Through these spots run in a line and scratch it in. This line is the sheer and deck line in the body plan and just as it is unalterable in the other two plans so it is in this one.

The chine lines of V-bottom boats are picked up in much the same manner.

The next step is to mark off on each water line in the body plan the half widths of that waterline at the various frames. The height above the base line are also marked on the buttocks. When you mark a point on the floor always put a little ring around it so that it is distinguished easier and mark its frame number beside it to avoid confusion. Also mark in the frame endings and their heights on the keel as it will appear in the body plan and connect all the lines up. If a frame line does not appear fair in the body plan alter a water line or buttock in the other plan until it does so.

The method of fairing on diagonals is probably the easiest, and accurate if not more so than the compounded water line and buttock system. In this system the outlines of the plan and profile are faired as before, but water lines and buttocks are disregarded. Frame lines are extended past the sheer line in this method to allow the laying out of the diagonals which will have a much greater half breadth than any of the water lines. In Figure 6 you will see just how these diagonals are laid out. Unlike the water and buttock line system the body plan is the first step in fairing in the diagonal system. The body plan is first laid down from the table of offsets or from measurements from the model. After all the frame lines are in a few diagonal lines are struck across the body plan. These lines may all be laid in at a 45 degree angle which is the mean angle between water lines and buttocks or

they may be spaced in so that they will come square to a tangent line on the midship frame. When they are laid in square to tangent lines, the midship frame is usually divided into a convenient number of equal parts and the tangent taken on these points.

When all diagonals and frame lines have been drawn in the body plan, the fairing of the diagonals may be started. On a thin batten pick up from the body plan the distances along each diagonal for every frame. Transfer these measurements to the plan and fair the line in the same manner as the water lines which I have described before. Note how the heights of the diagonals are projected to obtain their endings, see Figure 6. The corrected distances are now taken back to the body plan and the faired frames run in. If a frame line does not run fair through the spots on the diagonals in the plan should be altered to make it do so. Often in altering diagonals, and also water lines and buttocks, to make a frame line fair, several frames forward and aft of the unfair one may have to be altered to bring the unfair frame into unison.

Fairing can be compared to sculpture for it is really this art on a large scale. The sculptor in modeling his figure in clay is doing the same thing that the loftsman does in fairing his lines. In watching both of these men at work one sees the great similarity between the two. The sculptor when he alters his lump of clay and steps off a few paces to observe the result has a counterpart in the loftsman looking along his batten, modeling the figure of a ship.

After the lines are faired by either of the processes described before, there are many little minor operations on them before the boat may be built. Lines as they are faired represent the outer surface of a wooden boat. To make the moulds, keel and frames and stem, the planks which cover these members must be taken off. In boats where the frames are bent into ribband wooden forms called moulds are made. As these moulds are to the inside of the planking and the line on the body plan or those obtained from the model represent the outside of the planking, a process called taking off is used.

The easiest way to take off the plank from a frame or mould is to first make a taking off batten, see Fig. 7. This is a flexible strip of wood or metal on which a number of wooden cleats are fastened. On each of these are marked the thickness of various planks used in boat building, these thicknesses having been marked from the inside of the batten. By inside I mean the side which will always be used as the working line for frames or moulds. A hole is also drilled in each cleat through which nails may be driven. When it is desired to take off the plank from a certain mould of frame the marks on the cleats for the thickness of the plank are set to the line on the body plan and the mould fitted to this while it is nailed on the floor.

Rabbet lines for the stem and keel are also found by taking off, but in a different manner, although the principle remains the same. In Figure 8 this process is shown. Lines are drawn through the stem at different points as near square to its outer edge as may be judged by the eye. These lines are projected until they cross several frames or water lines. In Figure 8 I have not spaced the water lines as close as they usually are in practice, but those shown serve the purpose of illustration. In condition "A" a square line crosses two frames. To obtain the bevel for the rabbet at this point, find the half width of the frames on the body plan the height where the line A-B crosses them and lay off these half widths "F" on lines that are squared to "A-B" at its intersection with the frame lines. With the plank thickness properly set on these points and the outer edge of the rabbet, the taking off batten is used to obtain the inner edge of the planking. A line squared from the outer edge of the rabbet to the inside of the planking will give the inner edge of the rabbet.

Condition B is very similar to condition A except here a water line is crossed and whose half width squared off will give us another point for our line.

Condition C is one whose location enables us to pick it up directly from the body plan, all the rabbet lines of the keel may be picked up from this plan alone.

Another thing which often puzzles the amateur is the developing of the transom. In the body plan we have this member shown with its width correct, but its depth is foreshortened by projection. In the profile we see its true depth but not its width. The art of finding its true shape is very simple and is called development. In July YACHTING the development of the transom was shown on the drawing of the lines for the 19-foot sloop. Reference to this will help in the following explanation.

On the transom rake as shown in the profile project a line where every water line crossed it, square to the rake and the top of the transom is also laid in. On these lines lay off the half breadth of the water lines and top as they are shown in the body plan. A line through these spots will give the true shape of the

(Continued on page 44)

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Continued from page 43

transom. Bevels for the transom may be lifted at every water line on the plan view and the plank taken off with a taking off batten.

Bevels are another thing which should be given consideration, and an instrument called the degree stick is used for this. To make a degree stick, lay off on the floor a quadrant of a circle with all the 90 degrees projected from its center. Parallel to one of its sides and at a distance equal to the frame spacing of the boat draw a line and project all the degree radials to meet this and mark and number them off on a stick laid on the line. Now to find the bevel of a frame on the body plan, lay the stick with its zero mark on the frame whose bevel we wish to find and the stick pointed toward the next frame in the direction in which we wish to find the bevel. The point at which the next frame line crosses the stick will show the amount of bevel between the frames, which may be lifted from the quadrant with a carpenter's bevel square. The theory of this little instrument is that a 45 degree triangle has its two square sides equal if our degree stick showed 45 degrees from the body plan the bevel would be equal to the frame spacing, all other readings will be in proportion.

The amateur will do well after reading the foregoing to hunt all the drawings of lines in the magazines that he can find and study them. In doing this he will learn for himself a great many things which I have not the time or space to enumerate.

An old and tried motto "Learn by doing" will apply very well in this case and the amateur may try fairing upon a small scale by using a smooth board and a thin batten. Having procured a draftsman's scale he can lay out his lines from any table of offsets he may be able to procure. The board will serve him as his miniature loft floor and his batten may be pinned down with ordinary pins driven on each side of it or with weights having a thin projection on one end. These weights are called ducks in the hull drafting rooms of large shipyards and are shaped very much like this fowl but having their bottom made a flat surface. The bills are generally made of brass wire bent and sharpened at the ends.

The process of fairing on a small scale is often resorted to in big shipyards, and the body plan put down from the small scale offsets. The Margarita a 19 foot sloop which was described in July YACHTING was faired in this manner on a scale of two inches to the foot.

Some Details of Planking

Continued from page 22

the middle the center is pressed down on top of the float, worked quickly along the top to the ends, the edges being kept up all around. The edges are then pulled down very tightly toward the chines, taking care to pull out all puckers in the fabric. Air pockets are forced out from under the fabric by rubbing firmly from the center towards the edges and ends. The fabric edges are secured by copper tacks to the chine stringers, spaced about 1 in. apart. When completely stretched, the whole of the fabric is gone over with a hot flat-iron (an electric one preferred) heated sufficiently to draw the glue through to the surface. Care is taken not to overdo this ironing process, otherwise the glue would either harden or be drawn right out and thereby fail to hold the planking to the planking. The glue is allowed to dry thoroughly for at least two days in the same room before painting over. Three coats of paint are sufficient for the outside, the first one being thinner than the remainder.

When the fabric is used between the skins of the double planking the same general method is followed. The fabric in this case is not stretched so tightly as the outside covering, and is tacked here and there to the inner planking to hold it in place while the outer skin is being built over.

If it is found necessary to make a seam, the lap is arranged so that the edge of the fabric in a transverse seam does not face forward on the outside. The after edge of the foremost piece laps over the foremost edge of the after piece.

*Relative to the above we would state that the use of JEFFERY'S WATERPROOF LIQUID GLUE, C QUALITY, has been so extended for seaplane float construction for the last year or two that it was deemed advisable to make the glue especially for that purpose. The use of hot irons was in many cases extremely inconvenient, and the glue which we are now supplying eliminates them. No heat is required—a cold iron or a block of wood will smooth the fabric out and produce most satisfactory results

When Old Ocean Labours

Continued from page 38

they did a fair thing, or appeared to do so. The second mate, younger still, followed his superior's lead; and the third was one of the juveniles in the "Ark," as we now called their house, and did nothing at all, in common with his colleagues.

The captain seldom spoke to anybody; when not reading he was busy making mats with all sorts of coloured Berlin wool. Indeed, a quieter ship's company it would be very difficult to imagine; and, altogether, if we could have managed a square feed once a day, Phil and I would have rather enjoyed the trip, notwithstanding the dirty, wet time we had

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come through, and which we knew we might expect a repetition of by and by.

In spite of her great sail area, so heavy and so deep in the water was *the Iron Earl*, that, except with half a gale on the quarter, or right aft, her log seldom showed more than eight knots. But, anyhow, her lines were too coarse for speed; she was built emphatically as a carrier, her huge interior taking a cargo that, even at the low freights ruling, left a fair margin of profit owing to the mere force of quantity. Thus a possible passage of four months or so gave her master little uneasiness, although to the skippers of the dashing little clippers of the 'seventies and early 'eighties, racing home with the new wool clip, anything over ninety days was a catastrophe. But the tramp steamer has killed the clipper; and the modern sailer, to make up for the disparity in speed, has to be capable of stowing away an enormous cargo. Hence, too, the pinched economy visible in the victualling and manning of the average deep-water sailing ship.

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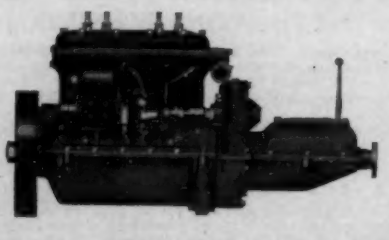

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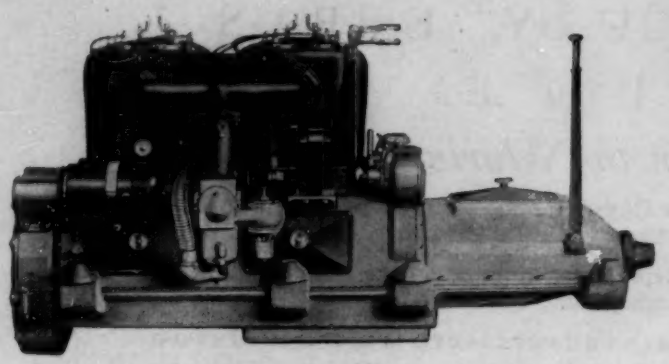

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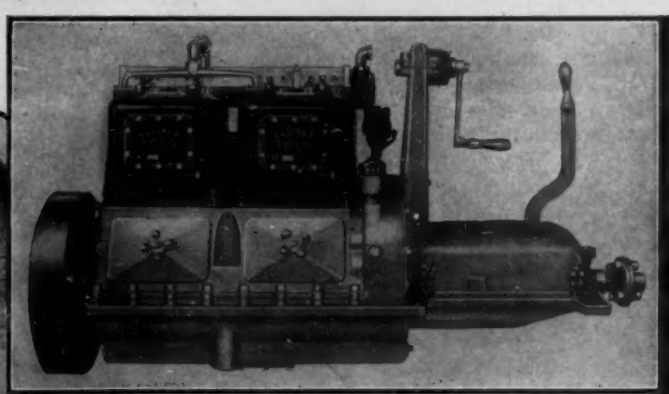

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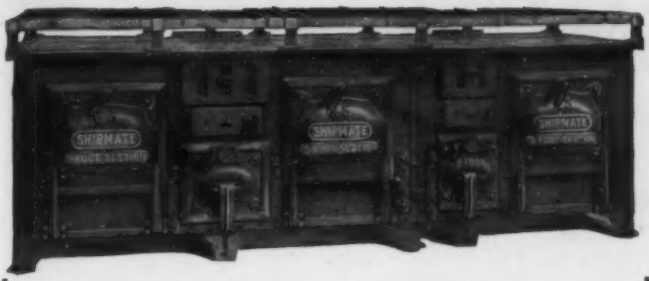

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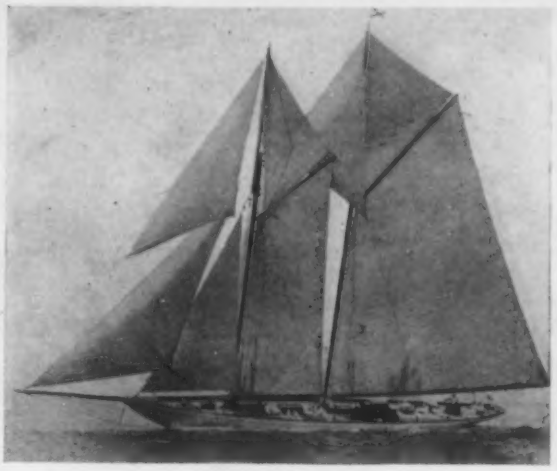

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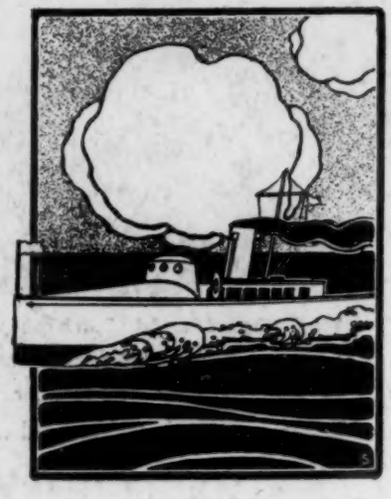

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